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The Journal of the Fire Protection Profession

NOVEMBER 28, 1928

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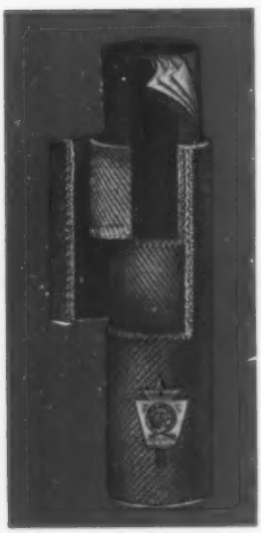

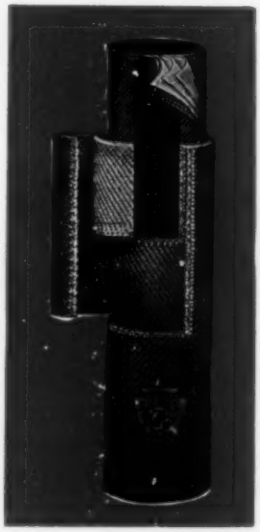

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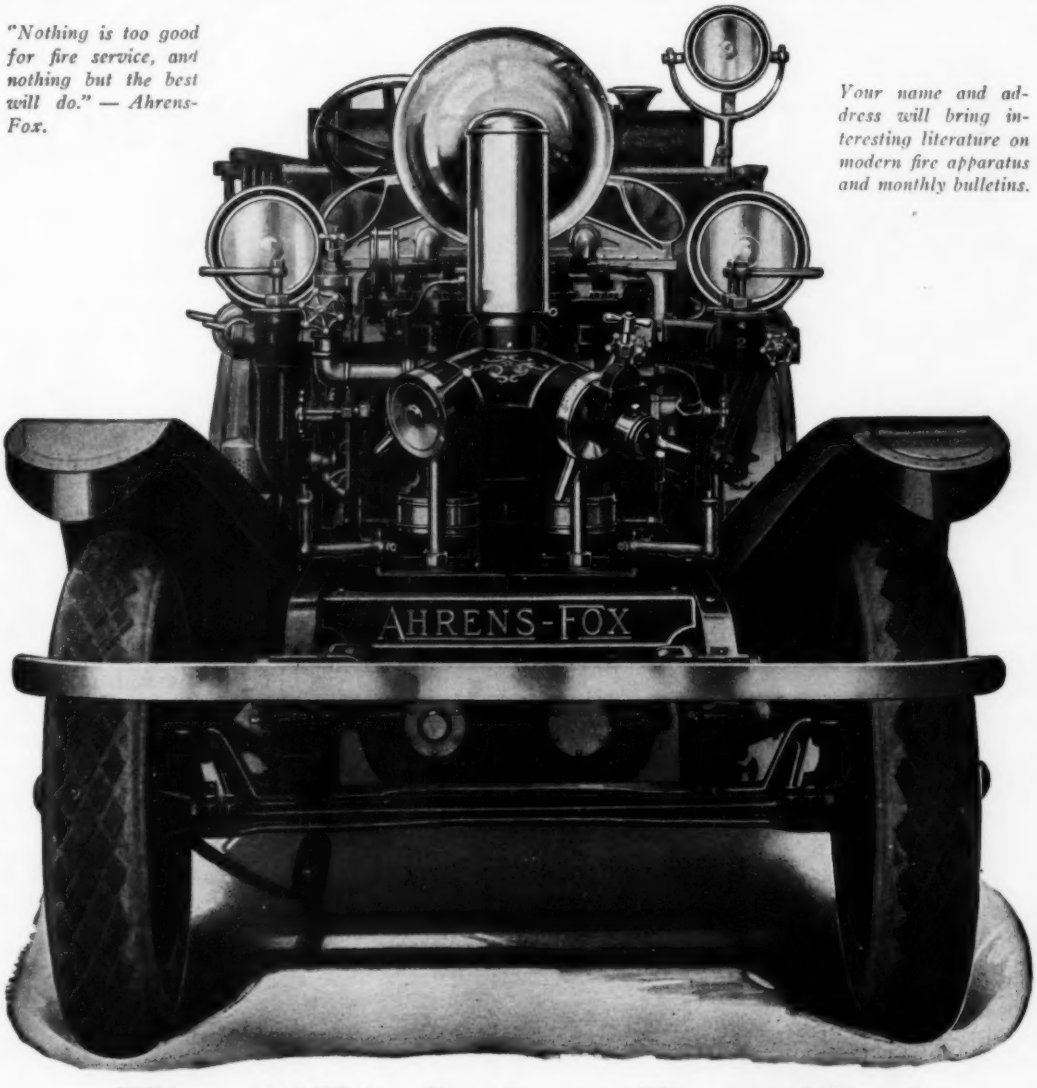

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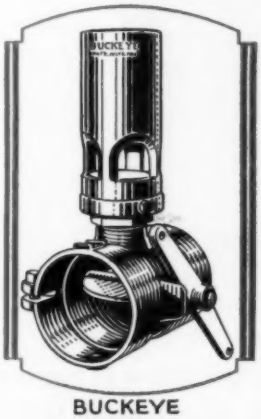

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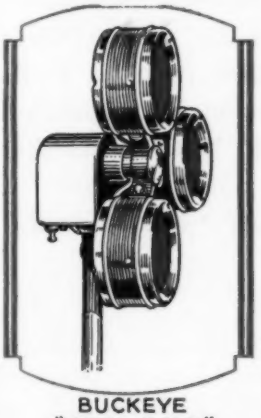

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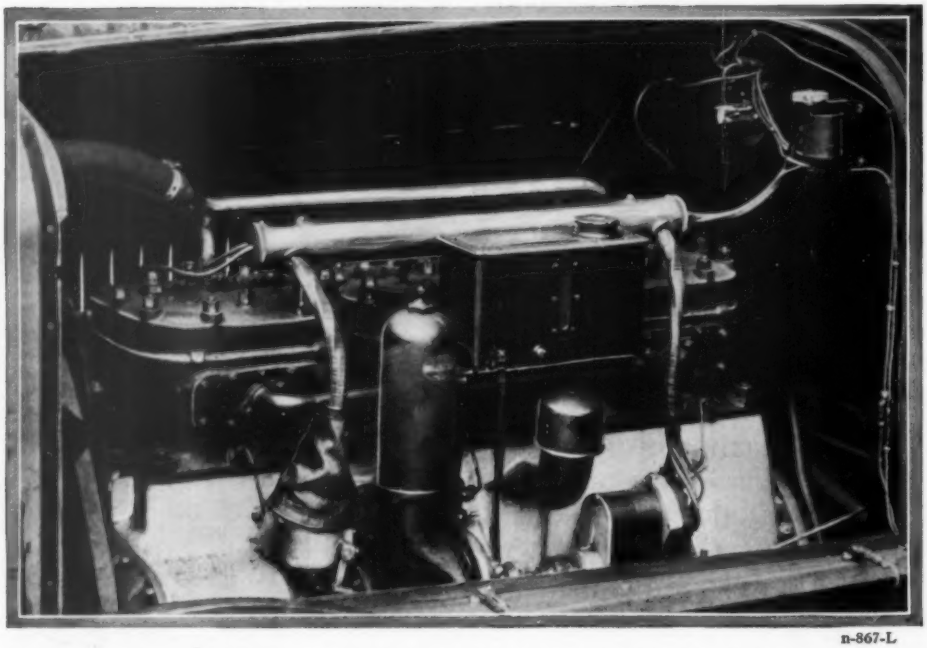

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The Journal of the Fire Protection Profession

VOLUME LXXXI NOVEMBER 28, 1928 NUMBER 24

Mapping Forest Fires by Airplane

How Los Angeles Forestry Department, in Conjunction with U. S. Forest Service, Informs Its Fire Fighters—Maps Tell of Fire's Condition

By FRED GOODCELL*

IT IS only to be expected that with the gradual perfection of the airplane, its uses as a fire fighter will increase. The following article tells of the employment of the plane in the mapping of forest fires to facilitate the handling of these destructive agencies:

The airplane, which proved its value as a vehicle for detailed observations over vast areas during the World War, is still a worthy ally in an ever-present peace time warfare—combatting forest fires. Particularly is this true in the Far West, where rainfall is not sufficiently plentiful to ward off the dangers from fire which constantly menace timber and underbrush.

Mapping a Going Fire

The Los Angeles County Forestry Department, in conjunction with the U. S. Forest Service, has realized the highly important place aviation now plays. It has been the policy of these organizations for the past two years to have an agreement with the Western Air Express each year for the use of one of their ships, this for the express purpose of patroling the mountainous areas during the fire season. The fire season starts about the first of May and lasts until the winter rains come, usually in December. The ships are also used to a very great advantage during a going fire, as the following incident related by C. M. Meredith, assistant fire warden, will show:

"On September twenty-fourth, at four thirty p. m. this office received a call from the U. S. Forest Service, asking our Department if we had a man available to fly over the Ridge Route fire and make a survey of the extreme western boundaries.

Type of Map Used

"At this time I might explain the type of map in use on these surveys. We use the U. S. Government Topographical sheets which give the Township, Range and Sections, each section being numbered from one to thirty-six. Then while flying over the fire a very accurate drawing can be made of the fire burning below. A cross is used on this map to show where the fire is burning most rapidly, or in other words, the location of the hottest spots.

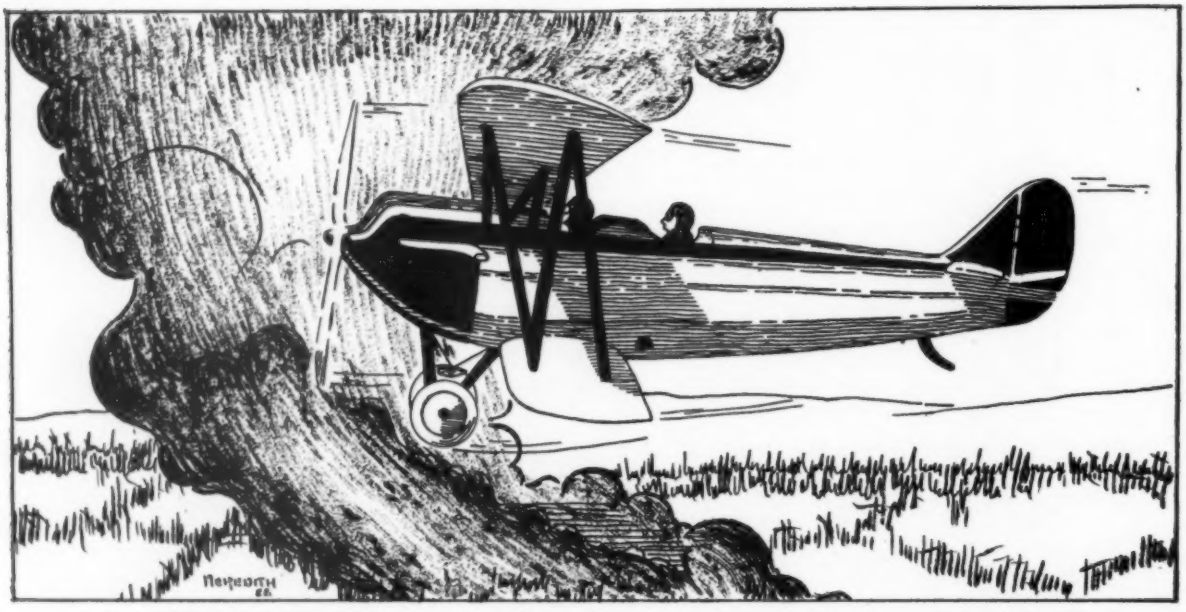
The Start for the Scene of Fire

"At four thirty-five p. m. I was notified to get my maps together and after a few detailed instructions given to me just what was wanted on this trip by County Fire Warden Spence Turner, I was turned loose with the final words: 'Get the dope or keep on going.' Time was slipping by very rapidly and to make matters worse visibility was reported as very poor from our Lookout Towers.

"After crashing traffic for what seemed like hours we arrived at Vail Field on Telegraph Road, the terminal of the Western Air Express, where a Douglas Mail Plane Type M. 2, piloted by H. B. Cock, was out on the line warming up. After a hurried discussion about the thickness of the weather, we slipped into our 'chutes and decided we would take a shot at getting through the fog and haze. We had figured that if the visibility was too bad we would return to the field. We

*Western Air Express, Inc.

> "AFTER a check of this survey, we found that, in spite of all adverse conditions, we had registered a 90 per cent correct score and this correct information was obtained in the short space of one hour and fifteen minutes from takeoff to landing. That night several hundred men were put in on the fire line at the hottest spots and the fire was declared under control the next day."



Sketch Showing Airplane Making Survey of Forest Fire, with Assistant Fire Warden and Pilot on Board

climbed aboard, taxied out, headed into the wind and were off at five fifteen p. m.

Preparations for the Survey

"While I was arranging my maps and getting ready for a hurried survey of the fire line we were gaining altitude. We found that the ceiling was very low and off to the west the fog was rolling in thicker than the well known pea soup. A pall of smoke lay over the rest of the surrounding country. My fears grew to grave consternation that our mission would spell failure. It was of vital importance that the men on the ground should know the direction of the fire and at what points the fire was making the most headway. It was our duty to get this information to these men that evening for on a going fire we have a decided advantage in our favor at night, that is providing there is not a high wind blowing. At night the humidity rises and the temperature drops except in unusual cases. At night fires are usually reduced to a lower burning point if the above holds true.

"The 450 HP Type "A" Liberty was working to perfection. I thought, if I could only synchronize my work ahead to the smoothness of the motor as it pulled us through the air. I thought perhaps the motor would develop a pain in its innards and we would have a forced landing, or I might have to hop over the side with 'chute for it sure looked like the deck was stacked, but the motor never paused and roared out its defiance at me. Then, suddenly, we were over the portions of the fire that had been brought under control.

Making the Maps Under Difficulties

"I slipped out of my safety belt, grabbed my map and pencils with a 'do or die' grasp, oriented myself and the fight was on. Being in the forward cockpit I did not have the vision that I would have had in the rear cockpit, as the wing assemblage prevented me from looking over the side and straight down. I tried standing up but my 'chute seemed to get into every conceivable position that would annoy me, the slip stream from the stick buffetted me about, and to add to this the air currents over the fire made the going bumpy.

"Then Cock, the pilot, took a hand and through his capable and skillful handling of the ship he made my work considerably less by banking the ship to the right or left and at the desired angle that would give me better visibility. Finally he nosed the ship south and to home. It was now very close to darkness and we could see the twinkle of the automobile lights coming over the Ridge and the lights at Castaic. By this time it was becoming quite chilly. However, we soon sighted the landing lights at Saugus Field and after circling the field twice, Mr. Cock set the ship down with scarcely a jar, landing at six forty p. m.

Victory the Result of Survey

"After seeing to the safety of the ship for the night we were met by a car which was sent out to pick us up and return to Newhall headquarters, where I phoned the result of our survey to the U. S. Dispatcher at Pasadena. Two copies were made from the original survey and rushed to the camps on the firelines where they were carefully gone over as to the logical place to attack the fire with the greatest amount of success. After a check of this survey the next day, we found that in spite of all the adverse conditions we had registered a ninety percent correct score on the survey and this correct information was obtained in the short space of one hour and fifteen minutes from take-off to landing. That night several hundred men were put in on the fire line at the hottest spots and as a result the fire was declared under control the next day, Sept. 25."

Two Firemen Killed in Buffalo Blaze

Two firemen were overcome by smoke and suffocated in a water-filled cellar at a fire in Buffalo, N. Y., that destroyed a two-story building. A battalion chief and a lieutenant were also caught by the smoke but rescued before they were overcome.

The fire is believed to have started from a defective oil burner in the basement.

The dead firemen were members of a company that filled in while a certain company went on duty to fight a huge fire at the waterfront. The men were the first to enter the burning building. The lifeless bodies were brought out by a rescuing party. Gas masks were used by the rescuers in entering the smoke-filled basement.

The Rookie—His Physical Requirements

What the Standard Qualifications for Candidates for the Fire Department Should Be—Suggestions for Fire Department Surgeons

By HUBLEY R. OWEN, M. D., Chief Surgeon, Medical Division, Philadelphia Department of Public Safety*

THE physical condition of the applicant for membership in the Fire Department is a most important consideration. The future fireman's value to the city and to his department will largely depend upon his bodily fitness and good health and his own safety hinges upon the matter, also. The following paper in one of the most complete and informative contributions to this subject ever presented before an association of fire chiefs:

It is my desire to discuss some of the problems which must be decided by the medical officer of a fire department. We are so frequently asked to explain the causes of our rejections of many applicants. The layman cannot always understand the technical reasons for such rejections.

In some cities an applicant must be physically examined on two occasions; first by the Medical Examiner of the Civil Service Commission and again by the Medical Officer of the Fire Department. It may be readily understood that if a man is passed by the Medical Examiner of the Civil Service Commission he feels as though he should be accepted into the Department, but in cities the size of New York and Philadelphia a period of six months to one year may elapse between the time the applicant is examined by the Medical Director of the Civil Service Commission and the time of his actual appointment; therefore it is highly necessary that he be reexamined immediately before appointment.

As part of my duties every applicant is examined within an hour of his appointment as a hoseman, and I frequently find causes for rejection which have developed between the time the applicant is examined by the Medical Director of the Civil Service Commission and my own examination.

Two Main Factors to be Considered

There are two main factors to be considered in the examination of a candidate. First, the welfare of the candidate himself and, secondly, the welfare of the city. We accept a man on a twenty-year basis; that is, with an expectancy of at least twenty years service. As an example, within the past week a man reported to me preparatory to being sworn in as a hoseman. On examination it was found that he had well-developed heart disease due to an attack of rheumatism subsequent to his examination by the Medical Director of the Civil Service Commission. His heart was compensating well at the time of my examination, but it was necessary to reject him because of the fact I had to accept him on a twenty-year basis and I was sure because of experience in similar cases that his heart would not have stood the strain of twenty years active service in the Fire Department. His friends were greatly disappointed and could not understand the cause of my rejection.

Importance of First Impressions

First impressions, whereas not always correct, are usually the keenest. Our first impressions when we undertake work of new character are always interesting to recall. I remember well my first impression of the position which I now hold and have held for the past twenty-one years. My thought was at that time that it would be impossible for me to please all those whom I apparently would be called upon to please, and in this regard my opinion has not greatly changed.

It would be of interest to know each man's first impression when he joins the Fire Department. I can well recall one man who was apparently not very favorably impressed. It was before the days of the Training School and he was immediately assigned to Truck 5. At his first alarm of fire he hit the floor, jumped on the apparatus and rode for about one city block. He then jumped off the apparatus and disappeared.

If an applicant for the Fire Department files his application, takes the examination, is declared eligible for appointment, and subsequently is appointed—all being accomplished without political aid—he will realize that it is incumbent upon him to make good in the Department more than the man who is escorted by a politician to file his application, the same politician accompanying him on each one of his trips until he is finally appointed and as frequently thereafter for promised promotions. This is equally as true for the applicant for the Police Department.

In this paper dealing with the physical requirements of an applicant for the Fire Department it must be distinctly understood that we are dealing in generalities and not referring solely to Philadelphia.

Civil Service and Department Standards Should Agree

It has been my privilege to visit the fire departments of most of the larger cities in the United States and also the departments in Montreal, London, Paris and Brussels. I have seen the work of the training schools for the fire departments in Grand Rapids, Mich., New

* Paper read before the 56th annual convention of the International Association of Fire Chiefs, at Philadelphia.

"THERE are two main factors to be considered in the examination of a candidate. First, the welfare of the candidate himself, and, secondly, the welfare of the city. We accept a man on a twenty-year basis; that is, with an expectancy of at least twenty years' service."

York, N. Y., and London. It was my good fortune to be in London for the graduating exercises of one of the classes of the Fire Training School of that city. This paper will be a resume of some of the facts that have been gathered in these cities and not confined to Philadelphia.

In some cities the procedure is so complicated that the Civil Service Commission holds one standard for the men seeking to join the Fire Department and the Medical Officer of the Fire Department has a second standard. This is erroneous. There should be a final decision between the Civil Service Commission and those in authority in the Fire Department as to the requirements for an applicant for the Department. Such requirements should be rigidly enforced.

At a meeting attended by the members of the Civil Service Commission, the Medical Examiner of the Civil Service Commission, the Director of the Department of Public Safety, the Chief of the Fire Department and the writer, held some months ago, certain rules governing the physical standard of applicants for the Fire Department were adopted. These rules were practically identical with those passed at a convention of the Police and Fire Surgeons at Grand Rapids, Mich., in 1925.

Objects of Fire Surgeons' Association

It is very probable that few of you here assembled even know of the existence of our Association. The Association of Police and Fire Surgeons and Medical Directors of Civil Service Commissions was organized in this city seven years ago. The object of this association is the discussion at its meetings of matters of interest pertaining to the welfare of the members of the two department—police and fire. We have agreed upon the physical requirements of applicants for the bureaus of police and fire and adopted a standard to be followed by the various cities. We have also standardized the treatment of many injuries occurring to policemen and firemen, such as the adoption of the prone or Schaefer Method for the administration of artificial respiration. The Henderson Inhalator for the administration of CO_2 and O in the treatment of asphyxia has been given preference over all other forms of apparatus in aiding with resuscitation of those overcome by smoke, illuminating gas, etc. Your time would be well spent with a paper of the accomplishments of our organization, an organization which has grown from a handful of physicians and surgeons in 1921 to 136 in 1928. It is my purpose to discuss some of the problems which we encountered and our conclusions.

Age of the Applicant

Let us take as an example the age of the applicant. Our standard, as set at Grand Rapids, Mich., for the age of an applicant for the Bureau of Fire was not less than twenty-one at the time of the mental examination and not over the age of twenty-nine at the time of filing application. This age limit was increased in Philadelphia to not less than twenty-five and not over thirty-eight years at the time of the written examination. I somewhat favor our standard as set at Grand Rapids, as it is believed that 38 years is too old for an applicant. An applicant for the Police Department might be of more mature age than 21, but I do not believe that the acceptance of a candidate of 21 years is a detriment to the Fire Department. We want men who are adaptable, who are not as the lavman says "set in their ways." Men of 21 to 29 will frankly take more chances than men from 25 to 38. The Fire Department is a hazardous occupation. The same rule held true in the Army. It was found to be more advantageous to take younger men into the Aviation Corps.

General Appearance

The applicant must be free from any marked deformity; free from all parasitic or system skin diseases; free from evidences of intemperance in the use of stimulants or drugs. The body must be well proportioned, show good muscular development, and show careful attention to personal cleanliness. Obesity, muscular weakness or poor physique must reject. The girth of the abdomen must not be more than the measurement of the chest at rest.

(To be continued)

Work Started on Barnard Fire House

Construction has started on a new fire house for the Barnard Fire Department, near Rochester, N. Y., on land donated to the department. The building will set back thirty feet from the street to harmonize with the other buildings.

The entrance to the station will lead one directly into a lounge room seventeen by twenty-six feet. There will be a large fireplace to give a more home-like appearance. From this room there is a doorway to the apparatus room.

The apparatus room will have space for two pumpers, with large double doors opening to the street. At the rear of the apparatus room will be an enclosed stairway leading to the basement and the second floor.

Chief Errol McBride

There will be a large meeting room on the second floor. There will be a women's coat room and a storeroom. There is a room with beds for four firemen and a shower and toilet room. A sliding pole will connect from the second to the first floor.

In the basement will be the kitchen, a large billiard room, a boiler and coal storage.

The building has been designed along lines of English architecture. It will be finished with stucco walls and stained brown trimmings. All of the windows will be of steel casements.

New Fire Station for Barnard Fire Department

Errol McBride, chief of the department, had an active part in the campaign for the $45,000 bond issue to finance the construction of the station and the purchase of apparatus. Members of the department presented him with a chief's helmet and coat.

Lake City, Ia., Orders Fire Apparatus—Lake City, Ia., has placed an order for fire apparatus. Delivery is expected some time in December.

Steubenville, O., to Have Fire Alarm—Steubenville, Ohio, has placed an order with the Harrington-Seaberg Corp. for a 12-circuit battery charging and line-controlling switchboard, 110 fire alarm boxes, and police signalling apparatus. The cable will be placed underground in the business section and overhead in the residential district.

A Junk Shop Fire Gets Away

Heavy Smoke Obscures the Paths of Extension—Exposures Neglected

THE junk shop fire is one which the average fire department dislikes. It usually means a lot of dense smoke, a stubborn, smouldering blaze, and hazardous work for the men operating close. When the junk shop is established in a frame building, conditions are very much aggravated.

In the fire described in this article of the series on administration, the blaze started in a junk shop in the early hours of the morning and had gained a big headway before its discovery. The operations of the department at this particular fire are described later on in this article.

The city in which the fire occurred has a population of approximately 250,000. It is located near the eastern seaboard, and has a well equipped, and well manned department.

The fire department consists of 22 engine companies, 3 combination chemical and hose companies, 8 ladder companies and 1 water tower company.

Water supply throughout the city is excellent, although the pressure is not quite sufficient for supplying hydrant streams.

Response to Alarms

The response to alarms in the section of the city in which this fire occurred is as follows:

First alarm: Engine Co. No. 1, equipped with two pieces of motorized apparatus; Engine Co. No. 2, equipped with two pieces of apparatus; Engine Co. No. 3, equipped with a triple combination; Ladder Co. No. 1 equipped with aerial truck and Ladder Co. No. 2 with city service truck.

Second alarm: Engine Co. No. 4 equipped with two pieces of apparatus, Engine Co. No. 5 with a triple combination, Engine Co. No. 6 with a triple combination, and Ladder Co. No. 3 with an aerial truck.

Third alarm: Engine Co. No. 7 equipped with two pieces of apparatus, Engine Co. No. 8 with two pieces of apparatus, Engine Co. No. 9 with a triple combination machine, Ladder Co. No. 4 equipped with a city service truck.

Fourth alarm: Engine Cos. Nos. 10, 11 and 12 each equipped with a triple combination pumper, Ladder Co. No. 5 with a city service truck and a water tower company.

Fifth alarm: Engine Cos. Nos. 13, 14 and 15 each equipped with a triple combination, Ladder Co. No. 6 equipped with a city service truck, and combination chemical and hose company No. 1 equipped with hose wagon carrying chemical tanks. All triple combination pumpers are of 750 gallon capacity.

The pumpers in the two piece companies are each 750 gallon capacity with the exception of the pumper in Engine Co. No. 1 which is 1,000 gallons capacity.

Property Involved

The diagram herewith shows the layout of the fire building and surrounding buildings.

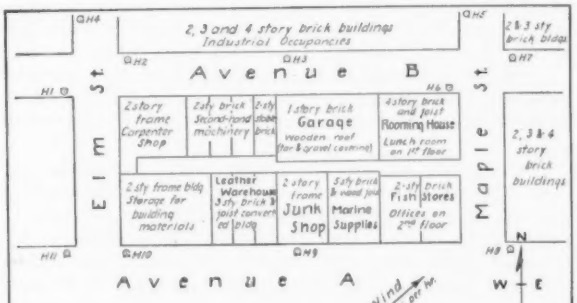
The building in which the fire started was a two-story frame dilapidated building used as junk shop, and well stocked on both floors with junk of various sorts, paper predominating. To the east of this building and adjoining it was a 5 story brick and wood joist structure occupied by a marine supply store. Within this building large quantities of rope, tarpaulins, canvas, and ship hardware were stored. To the east of the marine supply building and adjoining it were a row of 2 two story brick and joist buildings occupied on the ground floor as wholesale fish stores and by offices on the second floor.

Directly to the rear of the fire building was a one story brick garage with wooden roof, having a tar and gravel finish. A narrow alleyway separated the garage from the junk shop, but plain glass windows were used at the rear of the garage.

Other buildings in the immediate neighborhood are shown in the sketch.

The Fire

The fire apparently started about 3 a. m. on a hot sultry summer morning when the streets in this section


2, 3 and 4 story brick buildings Industrial Occupancies
2 & 3 sty brick bldgs
Avenue B
Elm St
Maple St
2 story frame Carpenter Shop
2 sty brick Second-hand machinery
2 sty brick
1 story brick Garage wooden roof (tar & gravel covering)
4 story brick and joist Rooming House Lunch room on 1st floor
2, 3 & 4 story brick buildings
2 sty frame bldg Storage for building materials
Leather Warehouse 3 sty brick & joist construction
2 story frame Junk Shop
3 sty brick & wood joist Marine Supplies
2 sty brick Fish Stores Offices on 2nd floor
Avenue A
Wind 30 mi per hr
Vacant Space
River (Not navigable for large craft)

of the city were deserted. The night man in the garage smelled the smoke from the burning junk shop, and upon investigation discovered the fire. He thereupon sent in an alarm by phone, to which a first alarm assignment was dispatched.

When the department arrived a heavy pall of smoke hung over the buildings in the fire block, and the smoke was so dense to the rear of the junk shop that the members of the department could not operate in the alley. Engine Co. No. 1 was placed at hydrant 10 and two lines were stretched to the ground floor of the junk shop, each being equipped with 1⅛ inch nozzle.

Engine Co. No. 2 was placed at hydrant No. 11 and a single line was stretched by way of ladder to the second floor of the junk shop from the Avenue A side.

Engine Co. No. 3 was placed at hydrant No. 8 and a single line stretched up the alley to the rear of the junk shop, but due to the dense smoke which had accumulated in the alley, it was impossible for the men to see what they were doing, or to get near enough to do effective work. This line continued to operate in the alley, but from a distance, and as subsequent events showed, to no advantage.

The attendant in the garage closed the rear windows

of the garage and walked around to see what the department was doing. While he was gone fire apparently jumped from the junk shop through the garage, after the windows had been broken by the heat, and gained a hold therein.

The department continued to operate under the belief that only the junk shop was involved, and was apparently satisfied with the progress being made until the officer in charge of the first alarm assignment was advised by one of the rooming house employees that fire was coming out of a skylight of the garage.

Upon investigation the entire garage was found ablaze.

A second and a third alarm were sent in in rapid succession bringing out assignments noted above.

Arriving with the third alarm assignment was the chief of the department.

In the meantime, while the apparatus on the second and third alarms was responding, fire coming through the roof of the garage swept up the four story brick and joist rooming house, entering the third and possibly the fourth floors at the same time. It also swept up the rear of the five story brick marine supply store and entered the top floor of this building.

When the first companies of the second and third alarms responded, they had on their hands four buildings ablaze: the junk shop, the garage, the rooming house and the marine supply store.

Engine 4 was placed at Hydrant No. 6 and two lines immediately stretched to the garage on Avenue B. Engine 5 was placed at hydrant 1 and a single line stretched up along Avenue B to the garage.

In the meantime fire was gaining headway in the rooming house and the guests were being hurried to the street by members of one of the truck companies on the first alarm.

Fire was also gaining in intensity in the marine supply store, although the progress of the fire in this building was not fully realized until the apparatus of the second alarm had been on the ground and put in operation.

Engine Co. No. 7 was placed at hydrant No. 7 and with the aid of members of truck company, two lines were stretched up the stairway in the rooming house, both going to the third floor. It was not possible to get to the fourth floor due to the condition of the fire on the third.

Engine No. 8 was placed at hydrant No. 4 and a single line stretched through the two story stable to the west of the garage, to operate on the rear of the junk shop. This line was hardly gotten in operation when the second floor of the junk shop went through, the roof and rear wall followed in short order. The line from Engine Co. No. 8, however, held its position and endeavored to check the intensity of the fire in the junk shop.

Engine Co. No. 9 was placed at hydrant No. 5, and a single line stretched by way of ladder to the top floor of the rooming house.

Immediately upon the collapse of the junk shop, a second line was stretched from Engine Co. No. 2 at hydrant No. 11 to the top floor of the marine supply store, by way of ladder.

One of the lines from Engine Co. No. 1 was also shifted from the junk shop to the marine supply building.

The department continued to operate with this assignment until it found the fire in the marine supply building gaining headway, when a second line was stretched from engine Co. No. 3 to this building, as well as the first line which was operating at the rear being sent to the fourth floor by means of ladder.

Fire continued to increase in intensity in this building and due to the highly inflammable nature of the occupancy as well as the great weight on the upper floors, it was deemed advisable to get the men out of this building and operate only from ladders.

The lines operating in the rooming house were having a difficult task in holding their own.

The chief of the department, however, figured that with the three alarm assignment he would be able to hold the fire.

After operating for a further quarter of an hour it was found that the five story building was going to go down, when fourth and fifth alarms were dispatched. Apparatus responding on these alarms were assigned to cover exposures, lines being placed to cover the buildings on the southeast corner of the block as well as to the west of the garage and junk shop.

While the wind was blowing vigorously toward the northeast, the lines put in operation by the fourth and fifth alarm companies, prevented the fire from jumping to Maple Street and Avenue B.

When the fire was finally brought under control it was found that the two story frame junk shop was completely demolished, the garage and marine supply buildings were leveled and the rooming house badly damaged on the upper two floors.

The Editor's ideas of the handling of this fire will be given in the next issue of this journal.

It's Mighty Unlucky to Cross the Path of Oncoming Apparatus

One man was killed, and a man and woman injured seriously when the automobile in which they were driving crossed the path of an oncoming pumper in Chicago. The engine was disabled but none of the company was injured. The photograph shows the result of the impact.

Salem Firemen Observe Anniversary

A banquet was held in the Hotel Hawthorne, Salem, Mass., on the evening of October 25 to celebrate the fiftieth anniversary of the founding of the Salem Firemen's Relief Association.

Chief Howard C. Kimball, of the Salem Fire Department, acted as toastmaster.

There were 141 persons at the dinner. Prominent among the guests were Chief William C. Mahoney, of Peabody; Chief Homer Marchant, of Gloucester; Chief James Warnock, of Swampscott; Chief Edward E. Chase, of Lynn; Chief Joseph Kelly, of Danvers; Daniel J. Looney, secretary of the Massachusetts State Firemen's Association; M. Joseph Manning, of Milton, treasurer of the state association; Michael J. McGonagle, of Boston, president of the Russell Fire Club; Capt. Frank H. Tarr, of the Wenham fire department; Francis E. Slattery, chairman of the Boston Schoolhouse Commission; Sergt. John Harkins, of the Salem police department; and Deputy Chief James S. Koen, of the Salem fire department.

Chief Kimball is president of the association and Deputy Chief Koen is vice-president. Lieut. Crowley is secretary and W. H. Annable is the treasurer. There were speeches and musical selections at the close of the dinner and Secretary Crowley gave a brief outline of the history and accomplishments of the relief association.

HARRY BELKNAP.

What Should Modern Rules Include?

Wide Diversity at Present in Rules of Different Departments—Third of a Series of Articles on This Subject

AS mentioned in the first installment of this article the Rules and Regulations of forty-one American fire departments were analyzed in making this compilation. The results below show which rules are most commonly incorporated in the various department regulations for the rank of *battalion chief*.

The first article discussed the subject of rules and regulations insofar as they applied to the responsibilities and duties of chief, while the second was devoted to assistant or deputy chief.

To review the rules and regulations applying to the rank of battalion chief we find the following:

Fourteen cities incorporate in their fire department rules and regulations, insofar as battalion chief is concerned, the following:

"It shall be the duty of the said officers whenever a fire shall occur within the district assigned to them, to repair immediately to the place of such fire, report to the officer in command of the fire, and under his direction take proper measures to have the engines, apparatus and men placed in the most advantageous positions and manner for the extinguishment of fire and the saving of life and property."

While thirteen show the following:

"They shall visit each company in their respective battalions once each week. They will at the same time make an inspection of the premises and apparatus, and see that everything is in proper condition, and that all accidents to men and machinery or needed repairs to buildings, are duly reported."

Thirteen cities also consider the following rule as essential for battalion chief:

"They shall at all times pay such attention to the good order and discipline of the members of the department as is due from their rank and position; and when any offense under these rules has been committed, if in their judgment prompt action is required, they shall immediately suspend the offender from duty and see that proper charges and specifications are duly forwarded to the Chief of Department, reporting their action."

Each of the following two rules appear in the regulations of twelve different cities:

"They shall constantly be on duty at their respective quarters except when necessarily called away on Department business or leave of absence.

"They shall perform such other duties as the Chief of Department shall prescribe."

And the three rules given below each appear in nine department rules and regulations:

"In the absence of the Chief of Department and Deputy Chief of Department at fires, the command and responsibility of the operations of the force will devolve upon the Chief of Battalion of the district."

"They shall keep the companies in their battalion equalized by special details, and see that they have always proper officers, engineers and drivers: Provided, however, that no details shall be made without the consent of the Chief of Department."

"They shall, under the direction of the Chief of Department, inspect and familiarize themselves with all buildings in their districts, at least once every six months and know where sprinkler valves are located and how to shut them off, and report their findings to the commissioner through the Chief."

Likewise the following four rules each find its place in eight department regulations:

"They shall promptly report any dangerous buildings to the officer in command at the fire."

"They will be held responsible for the reserve apparatus located in their respective districts, and see that it is kept in proper order and ready for immediate use; and if such is placed in service or is at any time unfit for use, shall immediately report such fact to the Chief of Department by telephone, or otherwise, immediately confirming the same by letter; also when the apparatus is returned, so that a correct record of spare apparatus can be kept."

"They shall instruct company officers in all branches of their duty and see that they enforce the various rules of the department."

"They shall transmit to the Chief of Department daily morning reports, and all other reports received by them. They shall make to the Chief of Department special reports of all fires attended by them during the previous twenty-four hours."

Seven cities list the following as one of the essential rules for battalion chief:

"It shall be the duty of the several Chiefs of Battalion to cause order to be preserved in the department."

Each of the three rules below find a place in six different cities:

"The Chief of Battalion shall be next in rank to the Deputy Chief of Department."

"At a fire only the commanding officer will relieve companies from duty, and the Chiefs of Battalion will remain at the fire until ordered to quarters by the officer in command."

"They shall promptly and officially report by telephone or otherwise to the Chief of Department, if they are from any cause unable to perform duty, immediately confirming the same by letter."

While the following three requirements are incorporated in the rules and regulations of five cities each:

"In case of injury of any member of the department in their district they shall see that a proper report to the Chief of Department covering all the facts is made."

"They shall receive all reports and applications from the various captains and forward the same to the Chief of Department."

"They shall inspect the uniforms of the members of each Company at least once a month."

Each of the following four rules is incorporated in the regulations of four different cities:

"When at a fire they shall, as soon as possible, relieve companies and send them back to quarters. In the absence of the Chief, the first Captain on the scene shall be instructed to perform this duty, as well as assuming command until relieved by a superior officer."

"They will be authorized to grant leaves for a period of not to exceed the hours of one platoon, subject to the approval of the Chief of Department."

"The hours of duty for Battalion Chiefs shall conform with Group "A" Platoon No. 1 and Platoon No. 2 of the Two Platoon System."

"They shall make a written report to the Commissioner, whenever they respond to a false alarm or to a fire of suspicious or of an incendiary origin, covering the facts as found."

While the three following rules are employed each by but three cities:

"A Battalion Chief shall not work in another Battalion Chief's place without the approval of the Chief of Department, or unless otherwise ordered."

"They shall inspect all theatres which may have been assigned to them once each week; shall test the ventilators and asbestos drop curtains therein, examine the exits, exit guide lights, fire escapes, sprinklers, hose and other appliances and facilities."

"Summarily suspend from duty any member of the Fire Department for a flagrant violation of any law, ordinance, rule or regulation of the service, where in any instance the reputation of the Fire Department is affected, and report such action to the Chief of Fire Department as soon as possible."

The following eleven rules are in use by two cities:

"The Battalion Chiefs shall be instructors at the Officers' class held twice a month or oftener, if necessary, when the Officers swear to pay-rolls. They shall instruct their Officers on the following subjects: Administration, discipline, fire fighting, fire prevention, building inspection, care of apparatus and equipment, training, drilling and all other matters concerning the Bureau;

activities that will have a tendency to increase the Officers' knowledge and thereby better the service."

"Shall co-operate with each other in maintaining their companies at sufficient strength for fire service."

"Except when responding to alarms, they shall notify the office of the Deputy Chief upon leaving quarters and also when returning thereto and shall cause a record of the same to be entered in the journal of the company in whose station their headquarters are located."

"Battalion Chief Engineers shall promptly communicate to the officers concerned all messages received from the office of the Chief Engineer."

"The rekindling of fires must be carefully guarded against, and when necessary for this purpose, a member or members shall be left on guard at the premises until possibility of rekindling has disappeared. Such member or members shall ascertain the name of the person in charge of the premises when they leave and report same to commanding officer."

"They shall instruct the theatre firemen and see that they are proficient in all branches of their duties."

"They shall inspect all locations for tanks for the storage of gasoline or other petroleum products; shall see that sufficient excavation is made for underground tanks as will permit two feet of earth to cover said tanks; and shall see that all pipes for filling or withdrawing the contents from said tanks are properly placed underground. If, in their opinion, the installation of any tank for the storage of gasoline or other petroleum products is, or is likely to be inconsistent with the public safety, they shall make a report on the prescribed form (17) to the Board of Fire Commissioners."

"They shall make or cause to be made, an examination of all places in their districts where material of a combustible nature has been allowed to accumulate and, if the occupant of such premises refuses or neglects to remove the same when so directed, shall report the fact to the office of the Bureau of Fire Prevention."

"They shall report ot the office of the Board of Fire Commissioners any change of address by members attached to companies within their respective Battalions within twenty-four hours after such change has been reported to them."

"They shall investigate and report in writing the full particulars of all meritorious or courageous acts performed by members or officers within their respective Battalions, together with an opinion as to whether such acts were attended with or without personal risk."

The following rules are enforced but one city of the forty-one, unless otherwise noted:

Rochester

"The Battalion Chief on duty shall have command of his district."

"Meal hours will not be allowed."

Pittsburgh, Pa.

"Should any of the battalion chief be excused or be relieved from duty, they shall assign a captain to act in their absence, subject to the approval of the Chief of Bureau."

"When fires are under control, every effort must be made to immediately open up traffic congestion, taking advantage of the facilities of the Traffic Officers and the Public Service Corporations. They shall co-operate with the representatives of both organizations to bring about normal conditions as soon as practical."

"Members attending fires at changing time will be relieved by Officer in charge when the other platoon reports there, except in cases where they are actually needed."

"They shall regulate by schedule the time and place for each Company under their command to have outside drill. They shall outline the confines of each Company's territory for building inspections. They shall take up the matter of District lines for building inspection with the Battalion Chief of adjoining territory and agree on certain streets as boundary lines between districts. The arrangement will eliminate the possibility of both covering or neglecting any buildings."

"When an officer of their command reports on the unfitness of a relieving Officer, they shall immediately respond to that company's quarters and ascertain conditions."

"They shall direct all officers and Members of their command to assist in sweeping of water and in protection of merchandise from damage and also to assist the Salvage Corps in the protection of life and preservation of property."

Detroit, Mich.

"No claim for back pay will be allowed for time lost on account of injuries where the injury certificate has not been filed. In all cases when members are off duty on account of injuries or sickness, the Department Surgeon must be notified and have access to the case, by being allowed at any and all times to examine the patient, if not directly in charge."

"In case of a fire requiring a second or more alarms, at which the Chief of Department and Assistant Chiefs shall be engaged, the ranking Chief, not engaged, shall proceed to Telegraph Headquarters and assume the command of that part of the department in service. Shall so place the apparatus as will be the best to respond promptly to alarms that may be received, and direct operations generally. Shall remain at Telegraph Headquarters until relieved by the Chief."

Providence, R. I.

"The district of each Battalion shall be determined by the Board of Fire Commissioners and shall be subject to change at any time by that body."

"Theatre inspection districts shall be such as the Board of Fire Commissioners may from time to time determine."

"A report of all such theatre inspections shall be made upon the prescribed form (Form 17, and forwarded to the Chief of Department together with a report of any conditions which, in their opinion, would be liable to cause fire or result in loss of life in case of fire."

"They shall make, or cause to be made monthly visits of inspection to all hospitals, asylums and other institutions of similar character in their respective company districts, and shall inform themselves regarding the condition of such appliances as may be found therein for use in case of fire, and shall also ascertain what means have been provided for the removal of the inmates in such emergency, and further, if, in their opinion, such institutions should have better fire protection, shall make recommendations relative thereto to the Board of Fire Commissioners."

"They shall transmit to the companies under their command all general or special orders relating thereto on the same day in which they are received from the Board of Fire Commissioners unless prevented by fire service or other emergency."

"They shall examine, correct and revise all requisitions for supplies before forwarding the same, carefully noting each article asked for, and disapproving such as they may consider unnecessary."

"They shall on the first week day in January, April, July and October of each year forward to the Board of Fire Commissioners a list of all unserviceable property in the charge of the companies within their respective Battalions, and shall also, upon the first week day of each month, render a report of all repairs that have been made during the preceding month upon all apparatus and equipments."

"They shall instruct the Captain of each company in their Battalion in all branches of his duty and shall see that the Captain instructs each member of his company."

"They shall make use of the automobile assigned to them in responding to fires and on all other Department business, and no member shall be detailed to act as chauffeur thereof except by order of the Board of Fire Commissioners."

Washington, D. C.

"Battalion Chief Engineers shall keep rolls of the officers and members of their respective battalions as follows:

Roll A:—All Captains, Lieutenants and Sergeants.
Roll B:—All men on engine duty.
Roll C:—All members not included on rolls A and B."

Newark, N. J.

"Battalion Chief will permit but one company at a time to change hose on company apparatus, which has not been used for a period of one month, and Chiefs of adjoining battalions will see that companies adjoining each other do not change hose at the same time."

Jersey City, N. J.

"Special calls and additional alarms while at a fire shall be transmitted from street fire boxes."

"Shall whenever loss of life, injuries to persons, or damage to property may occur as the result of accidents at fires or alarms in their District, or to members of companies in their Battalion, immediately report thereon by telephone to operator at Headquarters."

"Make a thorough and careful investigation into the cause and report the result, embracing a list of persons killed or injured and the damage to property, whether trifling or considerable. All such investigations, especially those relating to accidents to members, horses, apparatus, vehicles, vessels, etc., shall be made immediately after the occurrence and a written report forwarded without delay."

Fire Extinguishers—Their Use

Description of the Various Types of Fire Extinguishers and Their Application—Method of Classification

By CHIEF FRANK CHARLESWORTH, Fire Department, Providence, R. I.*

THE following paper, concluded from the November 14 issue of FIRE ENGINEERING, *is one of the most comprehensive and carefully prepared papers ever presented before the International Association of Fire Chiefs. It goes into the subject of fire extinguishers more exhaustively than has ever before been attempted in an association paper:*

The classifications given for the several types of extinguishers or appliances may be "A-1" "A-2" or "B-1". The letter indicates the class or classes of fires on which the extinguisher is suitable. The number gives the number of extinguishers needed to make one unit of first aid fire protection.

This method of classification indicates to the property owner and to us the number of extinguishers of the different types that should be at hand to control the specific fire as well as whether or not they are adapted to control such a fire. For example, the 2½ gallon soda acid extinguishers are classified "A-1," the 1¼ gallon soda acid extinguishers are classified "A-2." This explains the method of unit classification. Two of the 1¼ gallon extinguishers are needed to give a unit of fire protection, whereas only one 2½ gallon is needed. Some types of extinguishers are effective in more than one class of fire, hence the rating B-2 C-1. I am not going to give the ratings of all appliances but refer you to the "List of Inspected Fire Protection Appliances" of the Underwriters' Laboratories.

Soda-Acid

Classification 1½ gallon A-2; 2½ gallon A-1. This type of extinguisher was among the very first, and with minor changes has continued and is probably the best known of all types of chemical extinguisher. There were originally several types, but they have now mostly gone off the market with the exception of the standard type of loose stopper 2½ gallon upset extinguisher. To digress a moment some of these old thin shelled extinguishers unapproved and unreliable may still be found in some plants. They are unreliable and dangerous and should not be used before inspection to see if shell is badly corroded or hose stopped up. The chemical action builds up a high pressure if not released, and serious accidents have resulted with loss of life in some cases.

Then there was the old cone break bottle type. The projection or knob was struck on the floor or wall which shattered the acid bottle and started the extinguisher. This dumped the entire acid charge into the water solution, dangerous pressures resulting in some cases. Some later types of this extinguisher have been approved by the Underwriters' Laboratories.

The general type of soda and acid extinguisher of today consists of a bicarbonate of soda and water solution of about 2½ gallons with about four ounces of sulphuric held in a loose stoppled bottle. When the extinguisher is upset the acid trickles into the soda solution. The chemical action results in the generation of carbon dioxide gas which develops a high pressure and expels a stream of gas and water from 30′ to 50′. This has a cooling and quenching effect. This type of extinguisher has been made for several years and proven its worth for fires in free burning materials such as wood, straw, excelsior and rubbish. We all know the efficacy of our chemical tanks on our first line defence apparatus. The water solution has the extinguishing effect of about so much water, but the ability to reach a fire burning from 30′ to 50′ away or on a ceiling or wall makes it of great value. The carbon dioxide gas is of some value in closely confined spaces such as between partitions, shelving, boxes, etc., where the gas is banked up and not dissipated by drafts or heat of the fire. It is not efficiently adapted for all classes or fires such as burning oils, waxes or other flammable liquids, although its fire record even under these conditions is remarkable. The stream from the soda-acid extinguisher is a good conductor of electricity and should not be used on fires around live electrical apparatus.

Sulphuric acid is hydroscopic, that is, it tends to absorb moisture from the air and will in time absorb enough to dilute the acid or cause it to overflow. For this reason the extinguisher will deteriorate slowly and the rules require that it be recharged once a year. Undoubtedly it would take several years to overflow the bottle, but we know the limit of one year is on the safe side.

Furthermore, the extinguisher is subject to freezing, even the acid itself freezing, at a temperature of 46° F. when it has become diluted so its density is about 60 degrees Beaumé.

Great care should be taken to prevent freezing, for extinguisher tank may be critically weakened without the defect showing. Under these conditions they are liable to burst when used, and a number of persons have

* From a paper read before the annual convention of the International Association of Fire Chiefs, at Philadelphia, Pa.

"THERE are several types of fire extinguishers — soda and acid, carbon tetrachlorid, foam, non-freezing, etc. We are faced with the question, which one is the best and will give the most efficient protection for the case at hand. Some are adaptable to several classes of fires; others should be more or less restricted in their use."

been killed in this way, and in nearly all cases it is probable that the extinguisher had previously been weakened by freezing or hard usage.

The only sure way to inspect a chemical extinguisher without discharging it is to properly recharge it. A partially discharged extinguisher should be recharged at once. This is true of all types.

Anti-Freeze Extinguishers

Classification "A-1". There are several types of this extinguisher which, due to the anti-freezing qualities of the solution used, give effective stream at temperature as low as 40 degrees below zero and are suitable for use in localities where the above temperature is reached. In operation they differ from the soda-acid extinguishers. In one type operation is effected by inverting the extinguisher which causes a weight inside to fall with sufficient force to set off a percussion cap. This ignites a charge of smokeless powder which in turn ignites a slow burning fuse. Gases given off expel the special calcium chloride solution. Another type operates from the acid reaction from a special container mixing with the anti-freeze extinguishing liquid.

Another is operated by the reaction between two solutions in a generating chamber, which produces a gas expelling the anti-freeze solution.

These extinguishers must be discharged, cleaned and recharged yearly. They require special recharges and the Manufacturer's instructions should be carefully followed. Their use in connection with fires in or near electrical equipment, such as switchboards, motors, etc., is not recommended.

Foam Extinguishers

A few years ago, about thirteen extinguisher manufacturers became interested in the development of a type of extinguisher which would have a blanketing as well as an extinguishing effect. This led to the perfection of the present foam extinguisher.

The principle of the foam extinguisher is the application to the burning substance or liquid of a blanket of foam containing bubbles of carbon dioxide produced by chemical reaction within the extinguisher between two solutions. These are a solution of bicarbonate of soda and a foam producing agent dissolved in water in the extinguisher tank and aluminum sulphate dissolved in water in an inner compartment. These extinguishers are usually put into operation by inverting. The resultant reaction produces a large amount of carbon dioxide as with the soda-acid, but this gas is enclosed in the minute bubbles of the stiff foam.

They are subject to freezing and must be protected where exposed to low temperatures. The special charges for recharging are supplied by the manufacturer of the particular extinguisher. They must be cleaned and recharged yearly to insure of efficient operation as with both the anti-freeze and the soda-acid.

Recent tests indicate they cannot be relied upon for complete control and extinguishment of alcohol and similar flammable liquids which unite with water due to the breaking down of the foam bubbles which destroys the blanketing and smothering action.

As stated before, the extinguishment is due to the blanketing and smothering effect, although the water in the solution does result in some cooling. The foam, although heavier than air, is lighter than the flammable liquids and will therefore float on the surface, blanketing and excluding the air.

This method of extinguishment of fire has been developed further than has the other types of fire extinguishers, and resulted first in a fixed system of foam protection for oil refineries and storage tanks where the two solutions were stored in large tanks with pumps and twin mains to convey the solutions to the points needed where the resulting foam streams were handled much as hose streams, to the present day development of the portable foam generator using dry powders, and because of the portable feature can be carried and used where necessary.

At present there are two types of approved (by the National Board of Fire Underwriters) portable foam extinguishers.

I will not take the time to describe them. The principle of their operation is as follows. The chemicals are in powder form, furnished in sealed cans by the manufacturers. The powders are manually fed into the hopper on the generator which is connected in the hose line from hydrant or pumper. The powder is drawn into the generator by the action of the water stream passing through the generator.

To quote from a National Board pamphlet, "Ordinarily the rate of foam generation when using a single discharge line consisting of 100′ of 2½″ rubber lined hose provided with a standard play pipe and 1¾″ smoothbore nozzle, is approximately 400, 500 and 650 gallons per minute when water pressures at the inlet to the generator are 50, 75 and 100 pounds per square inch respectively. With 150′ of 2½″ discharge hose the rate of foam generation is decreased approximately 25 per cent. Use of more than 150′ of discharge hose is not recommended. Where longer lines are needed it is desirable to place the additional hose between the source of water supply and the generator."

From the above description you can clearly realize a long step has been taken in developing equipment for the plant owners' use as well as use by our fire departments for the control of fires involving large quantities of flammable liquids.

The early fixed equipment which today with modifications and improvements is giving excellent results in fire control and extinguishment in certain properties and under certain conditions, of its very nature was not adaptable to fire department use except as they used the plant equipment. Unsatisfactorily controlled fires did result but these were mainly due to the humane element in operation of pumps and system, limited amount of solutions, breakage of mains, etc.

The Fire Department Idea Is Now Used by Others

The *San Francisco Chronicle*, a new paper in San Francisco, has adopted the plan of the fire department's brass sliding pole for use of pressmen in going from the press floor to the basement. There is no trap door covering the opening but there is a guard rail about the hole. A semi-circular sheet iron guard protects the rear and sides.—CHARLES W. GEIGER.

With the portable foam generator, and I firmly believe every fire department should have one or more as part of their regular equipment, its very mobileness recommends its use. It is not dependent on pumps or solutions and can be continued in operation so long as the supply of powder lasts.

These portable foam extinguishers are primarily intended for extinguishing fires in flammable liquids, but they are also effective on fires in other materials. They are not intended for protection of large storage tanks of flammable liquids as in oil refineries and oil tank farms, as are the fixed piped systems spoken of before, but they sure do give wonderful supplementary protection in connection therewith.

As the extinguishing effect is dependent on the blanketing, smothering foam, this blanket must be kept intact, and calls for some skill in using the hand extinguisher or the portable generator. With the first, the stream should be played against the side of the container or so the foam blanket will flow over without break; with the second, it should be used so that the foam will fall and form its blanket.

A stationary type of foam generator has also been perfected to protect dip tanks or small open containers of flammable liquids.

Operation generally occurs automatically upon a rise in temperature which actuates the release device, causing the two solutions to mix and the formation of foam.

Some care is needed, as with the hand extinguisher.

The hand extinguisher as with the soda-acid should not be used on live electrical apparatus.

The list of Inspected Fire Protection Appliances gives the following ratings to the several types—

1¼ gallon	A–2	B–2
2¼ gallon	A–1	B–1
5 gallon	A–1	B–1

Carbon Tetrachloride

This extinguisher, I understand, was primarily developed for use on electrical fires. Carbon Tetrachloride being a non-conductor of electricity and having a high di-electrical strength, they are now generally used for first aid extinguishing apparatus in automobiles and motor boats and general fire protection. These hand fire extinguishers are of 1 quart, 1½ quart, 1 gallon and larger capacities, and use as the extinguishing agent a special liquid furnished by the manufacturer which is composed largely of carbon tetrachloride with important components for lowering the freezing point and preventing corrosion. Because of the low freezing point, approximately 50° F. below zero, these extinguishers are particularly valuable where low temperatures prevail.

A word about Carbon Tetrachloride; it is a colorless liquid, with a peculiar odor and non-flammable. Its vapors are poisonous and anesthetic when breathed continuously. When pure, it is used as a solvent for fats; it is also used in the dye industry for cleaning and for rendering hazardous liquids non-flammable. Fifty per cent of carbon tetrachloride mixed with gasoline is non-flammable.

When used as a fire extinguisher for gasoline, oils and combustible materials, it partly vaporizes and dissociates into its component elements or other compounds, such as phosgene gas, or hydrochloric acid gas, which are dangerous to life. When in contact with hot iron it forms chlorine gas which is rapidly absorbed by moisture if present, forming a corrosive liquid. Chlorine gas itself is about two and one-half times heavier than air.

While these gases are poisonous, they are not liable

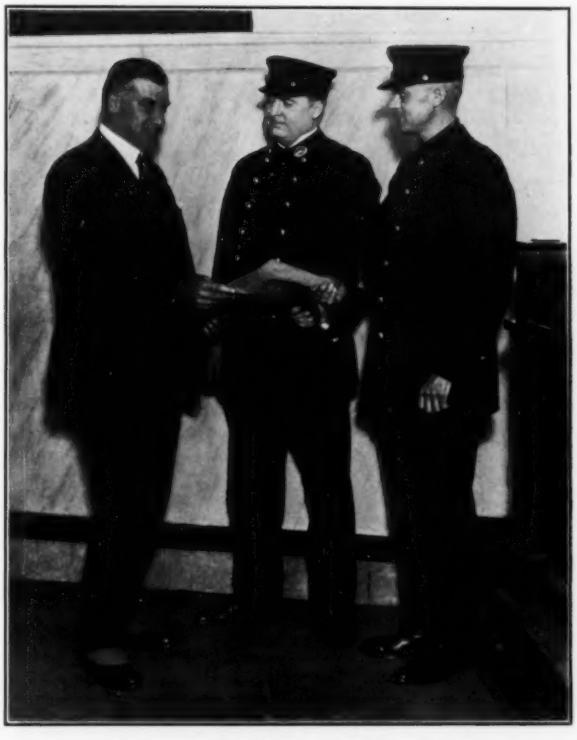
(*Continued on page* 1112)

Sons of New York Chiefs Promoted

Promotions and appointments in the New York Fire Department on November 1st consisted of thirty-one new captains taken in the order of their standing on a new eligible list for promotion to that rank, thirty-three lieutenants and forty-eight firemen on 90 days' probation.

The recent promulgation of a new eligible list for captain made possible the filling of all vacancies in that rank—vacancies which had been accruing since last January at which time the examination was held. The list, published by the Municipal Civil Service Commission a few weeks ago was led by Joseph B. Martin, Jr., of H. & L. Co. 3, detailed to his father Assistant Chief of Department, Joseph B. Martin. The detail has been continued.

Among the firemen promoted to Lieutenant was Thomas K. Larkin, Jr., son of Battalion Chief Thomas K. Larkin, Drill Master of the Department. The elder Larkin has been at the head of the School of Instruction for nearly twenty years. Most of the 6,000 firemen in the service have passed through his official hands. Lieut. Larkin had been a member of the Rescue Company No. 1 for several years. As a junior officer he has been assigned to H & L Co. 10 in Fulton street where his daddy



Leaders on Captain and Lieutenant List

From left to right, Commissioner John J. Dorman, Lieut. Joseph B. Martin, Jr., and Thomas K. Larkin, Jr.

once served as a fireman. The elder Larkin, like Chief Kenlon and many other successful fire fighters, was a sailor.

In making the promotions and addressing the new officers, no reference was made by either Commissioner Dorman or Chief Kenlon to the two honor men being sons of two of the department's chief officers. It was, however, the first time in the history of the department that two sons of fire officers were elevated on the same day.

Twelve of the forty-eight new firemen were members of the New York Police Department, who having taken both the police and the fire department examinations, accepted the police appointment earlier, then later accepted appointment in the Fire Department. Under a recent law in New York City, service in either the police or fire departments is reciprocal as to time, i. e.: if a policeman serves two years and then accepts appointment in the fire department, he can retire from the latter in eighteen years instead of twenty.

WM. J. DALY.

Connellsville, Pa., Defeats Station Plans—The proposition to issue bonds for the construction of a central fire station in Connellsville, Pa., has been defeated.

History and Evolution of Fire Fighting

Oldest Pumping Engines of Modern Times Made in Germany—Continued from November 14 Issue

By FRED SHEPPERD, Managing Editor of FIRE ENGINEERING*

THE oldest pump engines of modern times were certainly made in Germany, and about the close of the 16th or the beginning of the next century. The first one was that of Hewtsch, which was tried out at Nuremberg in 1656. In speaking of this machine, which is shown in Fig. 4, Beckman, a writer of that time, states:

"This engine is much practiced in Germany, and it hath been seen what great and ready help it may bring; for although the fire be 40 foot high, the said engine shall there cast its water by help of four or five men lifting up and putting down a long handle, in the form of a lever, where the handle of the pump is fastened; there are two suckers (valves) within it, one below to open when the handle is lifted up, and to shut when it is put down; and another to open to let out the water; and at the end of said engine there is a man which holds the copper pipe, turning it to and again to the place where the fire shall be."

Fig. 4—Earliest German Fire Engine, that of Hautsch. Nuremberg, 1656

In other words, this was a single acting pump secured in a tub.

This type of fire engine subsequently found use in England and other European countries.

Two Pump Engines in Cistern Long in Use

For nearly a hundred years after the date of Hautsch's engine those used throughout Europe, with the exception perhaps of a few cities in Germany, were of very similar design. But they consisted simply of two instead of one pump placed in a chest or cistern that was moved on wheels or sleds, and sometimes carried by men like the old sedan chair. These engines differed from each other only in their dimensions and the modes of working them.

Fig. 5 will convey a pretty correct idea of this engine which was used during the early part of the 18th Century. This machine belonged to Strasbourg. The front part of the cistern in which the pumps were fixed, was separated by a perforated board from the rear part, into which the water was poured from buckets. The cylinders were four inches in diameter, and the pistons had a stroke of ten inches. Each pump was worked by a separate lever, an injudicious plan, since a very few hands could be employed on each; and as the engine had no air vessel it was necessary, in order to keep up the stream, that the piston should be raised and depressed alternately—a condition not easily performed by individuals unused to the operation, and acting under the excitement of a spreading conflagration.

Air Chamber and Leather Hose Introduced

During the next 25 years two of the greatest improvements made in these machines were introduced about the same time; the air chamber and flexible pipe of leather; upon these principally the efficiency of the hand engines as used in this country depended. By the former the stream thrown from a single pump was rendered continuous, and by the latter, it was no longer necessary to take the engine itself into, or close to the building on fire; wherein most cases it was impossible, from the heat of the flames and smoke to use it with effect.

Hose had been used previously but seemed to have dropped out of use and was then rediscovered, or resurrected for fire purposes.

History shows us that in 1672 leather hose was first publicly used, to convey water from engines to fire by John and Nicholas Van der Heide, in Amsterdam, of which city they were inspectors or superintendents of fire apparatus. They made the hose in 50 foot lengths (the same as we now employ) with brass screws fitted to the ends, so that any number could quickly be connected together, as the occasion might require.

The invention of hose was probably the biggest step forward in the art of fire fighting.

For want of hose, engines themselves had been frequently burned; this was indeed a common occurrence and is often mentioned in the notices of conflagrations. In the great fire of London the rapid spread of fire drove the firemen from their engines, and many were destroyed. In 1731 a great part of the town of Blanford, England,

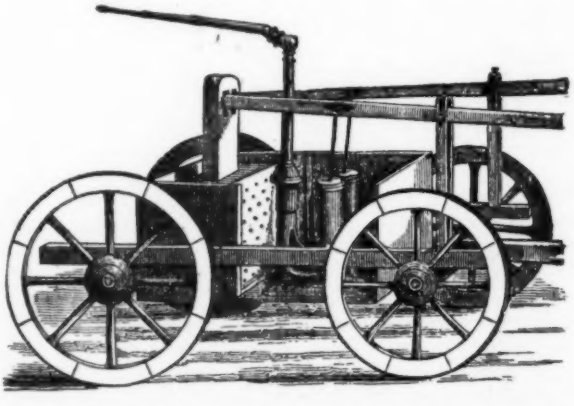
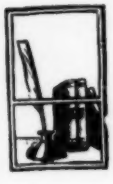


Fig. 5—Engine Belonging to City of Strasbourg, France, in 18th Century

(Continued on page 1110)

* From a paper read before the annual convention of the Pacific Coast Association of Fire Chiefs at Sacramento, Cal., Oct. 1-6, 1928.

WITH THE EDITOR



How Many Persons Each Fireman Protects

Each fireman in the United States protects from five hundred to two thousand persons. This interesting fact is brought out by statistics compiled by the Indianapolis, Ind., Chamber of Commerce. The occasion for the chamber collecting the information was the desire to act intelligently on a request by the fire chief for an increase in the personnel of the fire department.

According to the information collected by the Chamber of Commerce, the least number of persons protected by the members of fire departments in large cities was in Minneapolis, Minn., the number being given as 505. Minneapolis ranks sixteenth in population of the cities considered in the tabulation, has a population of 477,700, according to the census estimate of 1927, and has a fire department personnel of 886 members. On the other hand, Milwaukee, Wis., with a population of 536,400, fourteenth in rank, has only 256 members in its Fire Department, and protects 2,096 persons per fireman. New York, with 5,970,800 population, protects 893 persons per fireman, and Chicago, with 3,102,800, protects 1,244.

The most striking feature of the table is the great variety in the proportion of personnel of the fire department to the population of the city. It emphasizes the fact that much has yet to be accomplished in equalizing and standardizing the recognized number of population which it is proper for the fire department to protect as regards proportion of members to population. While, of course, conditions of hazard, etc., vary in these cities to a certain extent, there cannot be such a wide variance as to call for such a divergence as this table reveals.

Growing Recognition

It is a pleasing sign of the times that the daily press is beginning more and more to recognize the work and ability of officers and men of fire departments. Of late, more than ever before, newspapers have devoted space both in their news columns and in editorial comment on deeds of bravery, acts of heroism and evidences of efficiency both in the ordinary routine work of fire-fighting and also in special cases of emergency service.

An instance of this is to be found in an editorial published in the columns of the New York *Herald-Tribune* of November 20. In this instance the daily goes out of its way to pay a deserved compliment to Dr. Harry Archer, who, besides being Surgeon and Honorary Deputy Chief of the New York Fire Department, is also internationally known through his work in connection with fire department medical practice. The editorial is quoted herewith in its entirety:

"The honor of public recognition, if no more, is due the firemen and policemen and public utility actors in Sunday's vivid little drama of the pulmotors and the basement fire on 133d Street. Had that fire happened, even ten years ago it is probable that a dozen men would have died. Fireman Frederick Brickwedel almost did die, but Dr. Harry M. Archer, able and enthusiastic surgeon of the Fire Department, has two invaluable habits. He seems always to turn up where he is most needed and it takes him a long time to admit defeat. To Dr. Archer's perseverance and to the pulmotors Fireman Brickwedel and his companions owe the fact, news accounts make clear, that they are alive this week.

"It would be interesting to know how many lives have been saved by the past decade's progress in artificial respiration. There must be many thousands. Suffocation is a peculiarly dangerous misfortune because, unlike the majority of bodily accidents, it paralyzes the machinery for its own cure. Breathing is regulated, psysiologists agree, by a small nerve center somewhere in that bulge of nervous tissue just at the top of the spinal cord and just below the brain. It might almost be called one of Nature's mistakes that this center does not recognize the change of conditions that constitute the real danger. Lack of oxygen in the blood, presently to be fatal unless repaired, leaves the center's watchman undisturbed. Its response is to a quite different blood change, the accumulation of excess carbon dioxide. Unfortunately, these two changes do not always run parallel. For example, if suffocation occurs by the action of carbon monoxide gas, the deadly "black damp" of mines and fires, there is no stimulating increase of the carbon dioxide in the blood. The control center is out of commission before it knows that anything is wrong.

"Knowledge of these facts is responsible, too, for the greatest recent improvement in methods of artificial respiration. Following the researches of Professor Yandall Henderson of Yale, pulmotor experts now use in their gas tanks not pure air or oxygen, but gas mixtures containing a percentage of the stimulating carbon dioxide. As soon as this gas can be pumped into the body, by forcing it into the lungs and persuading the feebly beating heart to help distribute it, the watchman in the respiration center wakes up and gets to work on his own job. Sometimes this can happen after hours of apparent death, but to make it happen needs skill. For having that skill and using it Dr. Archer and the pulmotor men deserve all honor."

Inexcusable Vandalism

We can think of nothing more dastardly than the disabling of a piece of fire-fighting machinery. Human life depends on its efficiency. Property afire is at the mercy of its availability.

In the news columns of this issue is reported a piece of inexcusable vandalism on the part of some person or persons as yet unidentified in the village of Pelham Manor, N. Y., a suburb of New York City, wherein dwell many of New York City's most prosperous business men.

It is suspected, and not without foundation, that the malicious damage done to the machinery of a triple combination engine—the only one the village has—was the criminal act of some friend of the volunteer firemen, who sympathized with the vamps last Spring when Pelham Manor decided to employ a trained and experi-

enced fire chief to take command of a community rich enough to pay him for his professional ability.

FIRE ENGINEERING has no direct knowledge of this despicable act of destruction, but its correspondent is reliably informed, after due investigation, that the "die-hards" among the ex-fire-fighters have sworn vengeance on the village since the advent of the paid fire chief, which by the way, was accomplished only after a referendum vote by the residents.

Apparently these former volunteer firemen have not realized that, with the growth of their community, the progress of the times and the advancement of the science of fire engineering, the time was bound to come when paid fire officers were a necessity.

The Constables, the Vigilantes, the Rangers and the Sheriffs have yielded to the paid police when a community prospered to the point of having its own paid peace officers. Few, if any, of the former have been known to attempt any act of vengeance on their paid successors by imperilling the law and order of the community.

The early days of fire department history contains many splendid and unselfish records of service and heroism by volunteers—they constituted both the foundation and keystone of the fire-fighting profession. In view of this fact, it seems unfortunate, in this particular instance, that the volunteers of this progressive community should not have cooperated with the authorities, when the people had voted for a paid chief of undoubted ability, and have backed him up, instead of throwing obstacles in his way. If they had done this, instead of taking the action they did at the time, no such untoward act as this unseemly vandalism would have occurred to mar the fire department history of their village.

He Claims a World-Wide Record

The Utah firemen are proud of "Roby" Scott, but even at that they admit he is a problem. Roby is the association's mascot and he has held this position for the past three years.

But in that does not lie his greatness. He is eighteen years old and weights 350 pounds and a member of the Provo, Utah, fire department. It is claimed that he is the heaviest fireman in the world. Smiling Roby is not worried about any other claimants for the honor. Why worry? He has his ukelele and he is happy.

"Roby" Scott

One thing is certain. He is either a good advertisement of what Utah climate and surroundings can accomplish in the way of health, or he is an example of what can be done without the aid of dieting.

But what does that matter to Roby? The world record holder is content.

Skull Used in Talk

In order to impress school children with the fact that 15,000 lives are lost each year through fire, Chief Albert Herring of Murphysboro, Ill., uses a human skull as a feature exhibition.

He spoke before school children in Elkville and Dowell, Ill. Visits were also made to Harrisburg, Marion, and Mounds City. He impresses on the children, the parts of the fire prevention pledge and urges that the pledge be memorized. Chief Herring has done some good work in his community along fire prevention lines.

CHANGE IN I. A. F. C. DIRECTORS' MEETING DATE

The date of the Directors' Meeting of the International Association of Fire Chiefs, which was to have been held on Monday, December 3, has been changed to Thursday, December 6, at the Hotel Tutwiler, Birmingham, Ala. This change has been made to insure a full attendance of the Officers of the Association.

Chief Hawcroft of Reno Killed

R. B. Hawcroft, chief of fire department, Reno, Nev., was killed when the car in which he was responding to a fire collided with a taxicab commandeered by firemen to rush to the same blaze.

Both machines were travelling at a high rate of speed. The resulting crash awoke the neighborhood. The chief's car turned in the air and landed on its side, pinning the chief beneath it. Chief Hawcroft was knocked unconscious, although he revived for a few moments to talk to his brother, assistant chief. Mr. Hawcroft was removed to the hospital, where he died an hour later from a fractured skull.

The Late Chief R. B. Hawcroft

The fire to which the men were hurrying, was a small blaze caused by a fence on fire.

Chief Hawcroft was a member of the old volunteer fire department organization. He was always interested in firemanic matters while engaged in his trade of printer. In 1911 he was appointed chief and immediately set to work to reorganize the department. In 1917 the platoon system was installed and two new fire stations erected. He lectured in California and Nevada on fire prevention methods.

This was not Chief Hawcroft's first accident. In February, 1917, he was injured while fighting a fire at a brick plant. While handling a hose, a speeding car struck a parked car that rebounded and struck Hawcroft. He was confined to his home for several weeks as the result of this.

His main hobby was dahlia raising. He had one of the best dahlia gardens on the Pacific Coast and his flowers won many prizes. Another hobby was aviation. The chief was a close friend of all the mail pilots.

Chief Hawcroft was state vice-president of Nevada of the I. A. F. C., and a past president of the Pacific Coast Association of Fire Chiefs. He was fifty-nine years old. Funeral services were held from the Reno Lodge of Elks of which he was a charter member and an exalted ruler.

It Pays to Practice What One Preaches

Mayor James J. Walker, of New York City, presented medals to 450 children of the school system who had written the best essays on fire prevention. As the mother of one winner was watching the Mayor present her son with the medal, her husband was fighting a fire that developed in their home on Staten Island.

It was a strange coincidence that one so filled with fire prevention ideas did not practice them. He won a similar medal in an essay contest in 1927.

Work Started on Bristol, Pa., Fire House—Construction has started on a fire house in Bristol, Pa.

Questions and Answers

NOTE—Readers are invited to send in questions, which will be answered in the order received. Names are omitted from questions unless otherwise specified.

Extinguishing Gas Fire

To the Editor:

I have been asked for data on the best method of putting out fire on a high pressure gas main. In the city here we naturally turn off the valve in case of trouble, but in the country away from the valves we are at a loss to know just what to do.

Can you furnish me some data on this subject?

R. M. F.

Answer: As the gas main is located in the country where it would probably be difficult or impossible to get fire streams for use, your method of operation would be quite limited. Regarding fire streams, if it is possible to employ them, the fire may possibly be snuffed out by one or two streams of good volume. In accomplishing this the stream is brought quickly over the point where the gas is escaping and after cutting off the flame follow the flame up with the stream to prevent gas reigniting. If the leak is of considerable size it will take more than one stream—at least two. One cuts off the gas while the other operates just above the point to aid in preventing ignition of gas below the point where first line is operating. There is one instance on record where two streams were brought together directly over a gas well. These streams cut off the gas and the spray they produced in striking together over the gas well kept the burning gas and the gas escaping from the well apart sufficiently long to permit the gas which was aflame to burn out.

Probably the surest, and at the same time most satisfactory method—if properly employed—is the snuffing out of the flame by percussion from an explosion of dynamite or similar material. This method has been employed even in very large gas wells with success. One instance of it, which will give you a few details on how the method is applied is described below:

The fire occurred at the wells near Taft, California, about eight years ago.

With a flow estimated at one hundred million cubic feet of gas every twenty-four hours, shooting upward under enormous pressure, the well blazed for ten consecutive days and nights. All known methods of extinguishing it were tried and proved of no avail, until the plan of putting it out with explosives was submitted and tried. To Ford Alexander belongs the credit of this idea. He risked his life in bringing the plan to a successful issue.

The Standard Oil Company was drilling with a rotary drill in well No. 7, in the Elk Hills, near Taft, in the Midway Oil Fields, California. The well was at a depth of 2,135 feet in ten-inch casing, when a supposed water sand was encountered. To test this sand for water, the mud in the well was bailed down to relieve pressure and to allow any water present to accumulate in the well. During the course of bailing, at 11 p. m., the well blew out under tremendous pressure, and the greatest flow of gas in the history of oil production began.

The drilling crew attempted to get the well under control by closing the 12½ inch gate valve with which the casing was equipped, but the shale and sand carried by the stream of gas cut out the seat of the valve while the gate was being closed, and the well continued to blow. Two hours after the flow began the friction caused by shale and sand traveling at great velocity had produced a red heat on the casing, and the gas, igniting, burst into a column of fire, gushing 300 feet skyward.

The maximum width of the flame, about fifty feet, was reached about 100 feet above the ground. The gas emerged from the casing with such force that for a distance of twelve feet above the casing there was no flame.

The first attempt to extinguish the fire was made the following day by the assembling of ten boilers. From both the blowoffs and the steam connections of these boilers three inch lines were laid to within fifty feet of the well, where each branched into two inch lines and ran to the base of the flame. With the base of the flame twelve feet above the ground level, the work of laying these pipe lines, nevertheless, became a matter of human endurance against heat. The men worked behind large portable screens, with a stream of water constantly playing upon them from a three-inch line of hose. Water lines were also laid, and with the boilers and pumps throwing steam and water into the flame to their full capacity, there was no noticeable effect upon the fire.

The second attempt was made with the full capacity of sixteen boilers and four pumps throwing steam and water through three and four inch lines, but this effort showed no better results than the first.

The third attempt was made with twenty boilers throwing steam and water, four rotary pumps throwing water, two 125-barrel water tanks with four-inch steam jetted lines, and two pumps throwing fire foam.

With the preparation for the fourth attempt completed, there were twenty-one three-inch lines and nine four-inch lines into the fire crater. Twenty boilers and eleven rotary pumps were ready to throw steam, water, mud and carbon tetrachloride. This attempt and also the fifth attempt to extinguish the fire were failures.

The company now considered the idea advanced by Ford Alexander of conquering the fire by explosives. Mr. Alexander did practically all of the oil well blasting in the California fields. His experience and knowledge of explosives led him to the idea advanced, which was, essentially, to suspend a package of blasting gelatin upon cables in such a manner that the package could be safely brought to the edge of the fire at a distance of about forty feet above the ground.

Three derricks, approximately 100 feet high, were erected on three sides of the burning well at a sufficient distance so that the heat would not destroy them. A 9/16-inch steel cable was attached to the top of one of them, then laid around the well outside of the terrific heat zone, to another derrick, where it ran through a pulley at the top and the end attached to the drum of a small winding engine beneath. A guide wire was run to the third derrick to give a three point suspension and thus exact control.

The explosives, bound in one package and covered with heavy asbestos, were securely attached to this cable at the same distance away from the first derrick as the burning gas well. The explosives, before being made up into this package, had been primed electrically. When this was done, the engine under the second derrick began drawing the cable taut, which pulled the explosives toward the well and at the same time hoisted them. When they had reached the proper spot they were to be exploded electrically. It is unnecessary to state that this had to be done very quickly so as to bring the explosive charge to the necessary point before they were ignited or exploded by the heat from the burning well.

Eye witnesses at a greater distance state that when the package exploded the gas well fire was divided into three sections. The section at the point of explosion was moved bodily away from the column of gas in a horizontal direction, the upper section was blown upward and beyond danger of reignition of the gas column, while the lower section was snuffed out very much as a candle is snuffed out, the flow of gas being temporarily checked.

Nozzle Pressure and Stream Range

To the Editor:

Will you kindly answer the following questions in your Questions and Answers Department, and oblige.

T. W.

Question 1. Four 100 foot lines of 2½ inch hose are stretched from a pumper to a 4 to 1 siamese connection which is connected to 10 feet of 3½ inch hose fitted with a 2-inch nozzle. The pump pressure is 125 pounds. What is the nozzle pressure?

2. Three 100 foot lines of 2½ inch hose are stretched from a pumper to a 3 to 1 siamese connection which is connected to 10 feet of 3½ inch hose fitted with a 1¾

inch nozzle. The pump pressure is 125 pounds. What is the nozzle pressure?

3. What would be the distance the stream would travel in each of the above instances?

Answer 1. In this problem the four parallel lines of 2½ inch hose must first be reduced to a single line and the 10 feet of 3½ inch hose taken into account. The factor for changing four parallel lines of 2½ inch hose into a single line is 12.4.

100÷12.4=8.06 feet of 2½ inch hose, the equivalent in a single line of 2½ inch hose of the four parallel lines.

The factor for changing 3½ inch hose to 2½ is 5.8.

10÷5.8=1.72 feet of 2½ inch hose.

8.06+1.72=9.78 feet of 2½ inch hose, single line, which is the equivalent of the above layout.

The formula for solving this problem is: Nozzle pressure =E. P.÷(1.1+KxL)

K, a factor depending upon the diameter of hose and the diameter of nozzle is, for a single 2½ inch line with a 2 inch nozzle, 1.55.

L, the number of 50 foot lengths of hose in the line, is equal to 9.78÷50 or .1956.

Then nozzle pressure=125÷(1.1+55x.1956)
=125÷(1.1+.20318)
=125÷1.30318
=95.8 or 96 pounds nozzle pressure approximately.

Answer 2. This problem may be solved in the same manner as the preceding one, or it may be solved by an entirely different method.

Using the same method as in the preceding problem, the calculations are as follows:

First reduce the three parallel 2½ inch lines to a single line. The factor for reducing three 2½ inch lines to a single line of 2½ inch hose is 7.75.

100÷7.75=12.9 feet of 2½ inch hose single line.

Reduce the 10 foot lead of 3½ inch hose to 2½ inch.

10÷5.8=1.72.

12.9+1.72=14.12 feet, which is the length of a single line of 2½ inch hose equivalent to the above layout.

Nozzle pressure=engine pressure÷(1.1+KxL)

K for 2½ inch hose and 1¾ inch nozzle is 0.907.

L=14.12÷50=.282.

Then nozzle pressure=125÷(1.1+.907x.282)
=125÷1.355774
=92 pounds approximately.

The second method of solving this problem which gives better results is as follows:

Instead of reducing the layout to a single line of hose, solve directly by using the value of K for three parallel lines of 2½ inch hose supplying a deluge set equipped with 1¾ inch tip. This value of K is 0.115.

L, the length in 50-foot sections of any of the three lines, is 100÷50=2.

Then nozzle pressure=125÷(1.1+.115x2)
=125÷1.33
=94 pounds approximately.

In the first method of solving this problem we get 92 pounds pressure while in the second we get 94 pounds, two pounds greater.

Answer 3. Using the New York fire department rule of allowing 1 foot reach for every pound pressure at the nozzle, we would get in problem 1 an effective reach of 96 feet, while in problem 2 we would get an effective reach of 92, or 94 feet, depending upon which method we used for finding nozzle pressure.

Fire Stations Planned for San Antonio

Five new fire stations will be built in San Antonio with funds out of the $4,750,000 bond issue that the city will sell in November, according to an announcement by Fire and Police Commissioner Phil Wright.

The new stations will be of steel and reinforced concrete construction and will replace dilapidated frame structures now housing fire companies Nos. 5, 6, 8, 13, and 14.

A total of $350,000 has been allotted to the fire department out of the bond funds, Commissioner Wright said. Of this amount about $25,000 will be used for improvements in the fire and police signal systems and the remainder of the fund, with the exception of between $40,000 and $50,000 returned to the flood prevention department, will be used for the new fire stations.

All of the new stations will be equipped with double apparatus, instead of single, as is now the case with two of them. A Police sub-station will be erected in a building adjoining each of these fire stations.

Improvements in the fire and police signal systems will include a new underground cable in the business district, which was practically ruined during the 1921 flood, a new cable now being found necessary. Other changes that will increase the efficiency of both departments will be the installation of an automatic telephone switchboard at Central Fire Station to replace a PBX board now in operation.

It is probable that some new apparatus will be purchased during the coming year as the city is growing rapidly and while the fire department is very efficient, its growth has not kept pace with that of the city.

A. B. COCHRANE.

Special Suction Pipe Proves Effective

In an earlier issue of FIRE ENGINEERING, there appeared a description of a suction pipe for docks and piers designed by Battalion Chief John Spencer, stationed at Staten Island. The device was tested at the Municipal Ferry, St. George, Staten Island, and officials later stated that if the suction line was installed previous it would have saved a coal fire from developing into a large blaze.

The suction pipe is made of 5-inch cast iron pipe. The suction strainer is placed three feet below the water level at low tide. The pumper had to work at a fourteen-foot lift at this test. At each trial, sufficient water was delivered at the nozzle to satisfy the fire officials.

Chief John Spencer, Center, Attaching Suction Line to Cast Iron Fitting on Pier

Portland Honors Boy Orator

The fire department band and a large crowd of high school students turned out to welcome the return of Ralph H. McCullough, winner of a fire prevention oratorical contest in Portland, Ore., who was awarded a trip to the I. A. F. C. convention to Philadelphia.

The contest was sponsored by the Portland fire bureau. They paid the expenses of the winner to Philadelphia where he was a guest of the fire chiefs. In addition to giving his address at the convention, he made sight-seeing trips in Omaha, Chicago, Niagara Falls, Buffalo, New York, Washington, Atlanta, New Orleans, El Paso, Los Angeles and San Francisco.

Since his return to Portland, he has received invitations to speak before the students of a number of schools.

A Correction

In the advertisement of the American-LaFrance and Foamite Corporation appearing in the October 17th issue, page 894, Columbus, Ohio, is listed in a table of cities as having nine pieces of American-LaFrance motor fire apparatus. This is an error. It should have read Columbus, Georgia. Macon, N. J., listed as having ten pieces, should have read Macon, Ga.

While these errors are typographical ones, the company is anxious to have them brought to the attention of its friends.

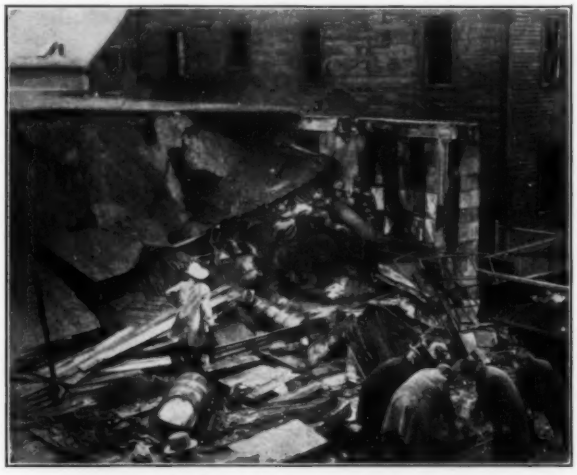
Waterford, Wis., to Buy Apparatus—Waterford, Wis., has voted to purchase fire apparatus and to erect a new fire house to store the equipment.

EIGHTEEN KILLED BY EXPLOSION IN LYNN, MASS., BOX-TOE FACTORY

Celluloid Explosion Believed Started by Careless Smoker—Force of Explosion Killed Mother and Five Children in Adjoining Home

MEMBERS of official investigating parties are convinced that some careless smoker unthinkingly caused the explosion that wrecked the celluloid-vapor filled factory of the Preble Box-Toe Co., in Lynn, Mass., and killed eighteen persons. It was the worst calamity that ever occurred in Lynn.

All workmen in the room, where four different kinds of explosives and inflammable material were stored, were killed. Two



Firemen Digging Under Cement Wall Supposed to Have Covered Victims of Lynn, Mass., Factory Explosion

workmen were blown through a cement wall. Many died as the result of burns.

With the first explosion an all-enveloping flame burst from the roof and all four sides of the one and one-half story factory building. There were about thirty employees inside. A puff of flame entered several homes nearby. In one home it killed the mother and five children. Flames traveled one hundred yards and started fires in five homes.

A general alarm was broadcast summoning every piece of apparatus in Lynn and calling aid from Swampscott as well. The series of blasts could be heard for several miles. Physicians and nurses were summoned by the Red Cross. Many were cut by glass, and others suffered from shock.

Insurance men who inspected the place said that the big hazard of the factory was the occupancy hazard which they termed severe and poorly guarded. It was known that large rolls of cotton were being impregnated in a pyroxilin solution and being dried in an open room. A large amount of explosive vapor was given off by the solvent. In the section of the building where the fire is supposed to have started, there was a box containing scrap celluloid.

A desk in the factory in which were three packages of unsmoked cigarettes, and an ash tray, gave rise to the accepted theory that the fire was caused by a cigarette.

As a result of this catastrophe, the Mayor stated that all factories using explosives "will be chased out of town." He said:

"I have asked Fire Marshal Neal to revoke every permit for the use of the explosive materials in manufacture or otherwise in any building not isolated at least five hundred feet from any other building. Explosive materials are sometimes used in shoe factories in connection with the manufacture of box toes and wooden heels. I shall insist that Mr. Neal put through a law like that even if we have to lose the entire shoe industry in Lynn."

Urges More Rural Departments in Oregon—The Oregon Fire Chiefs Association are sponsors for a measure to be introduced at the coming session of the state legislature, to establish rural fire departments. The measure would authorize the operation of fire protection districts outside of incorporated towns, with protection afforded by a pumper and a volunteer fire department in each district. It is the plan of the association to have these pumper units at from ten to fifteen-mile intervals.

WHAT'S BURNING

THE following list includes fires of $25,000 loss and over in the United States and Canada, for the periods designated in the headings. These figures, compiled from telegraphic reports, are based on estimates made at the time, and are subject to later investigation and consequent revision. Taken as a whole, however, they give an approximately correct view of the losses incurred. The figures represent loss in thousands.

Week Ending November 17

HOUSTON, TEX.—Nance St. garage and adj. property..... 25
BEACON, N. Y.—Garage and two dwellings..... 80
INDIANAPOLIS, IND.—Property Indianapolis Elevator..... 250
BEECH GROVE, IND.—Shed, Newcomber Lumber Co..... 25
WEST NORWOOD, OHIO.—Plant of Buchanan Chemical Co.. 25
DENTON, TEX.—Bldg. of Turner Grocery Co..... 25
ESTHERVILLE, IOWA.—Crawford Hotel and adj. property.... 65
PRESCOTT, N. Y.—Property of Quebec Coal Co..... 35
ANNAPOLIS, MD.—Garage of Johnson Lumber Co..... 40
TRACY, CALIF.—Whse. of Fabian-Fleisig Co..... 100
SIMPSON, SASK.—Canadian elevator destroyed..... 25
EAST ARLINGTON, VT.—Meyer Daniels store..... 30
HASTINGS-ON-HUDSON, N. Y.—Bldg. Hasting Paving Co.... 200
BELLEVILLE, ILL.—Grocery of R. H. Becherer..... 30
OTTAWA, ONT.—Hooper bldg. Wellington St., damaged..... 30
BATTLE CREEK, MICH.—Theatre bldg., Camp Custer..... 250
INDIANAPOLIS, IND.—Bldg. at 2911 Clifton St..... 25
WHIPPANY, N. J.—Bldg. of Independent Cork Co..... 65
CARSELAND, ALTA.—Post Office and adj. property..... 25
MONTREAL, QUE.—Garage of National Breweries..... 165
MONROE, LA.—Whse. of H. A. Budd Corp..... 25
NEWARK, N. J.—Knights of Pythians Bldg..... 65
FREEVILLE, N. Y.—Barns at G. J. Republic correction school.. 25
CAMPBELL, MO.—High School bldg. destroyed..... 65
NORTH JUDSON, IND.—North American Car Shops..... 80
OIL CITY, PA.—Bldg. of W. W. Laundry Co..... 45
BERKLEY, VA.—Plant of Coronna Chemical Co..... 35
ROME CITY, IND.—Triplet Hotel destroyed..... 30
FREEMAN, S. D.—Farmer's elevator and two adj. ones..... 165
BURBANK, CALIF.—Arsenal, First National Film Studios..... 35

Week Ending November 23

JOHNSON CITY, TENN.—Montrose Court Apartment bldg.... 220
NORTHFIELD, VT.—Stebbins bldg. and adj. property..... 165
GREAT FALLS, MONT.—Abbey and Central Hotels damaged.. 110
ROMEO, MICH.—Mill property of Geo. Knush destroyed..... 25
LOS ANGELES, CALIF.—A. J. Koll planing mill..... 40
BILLINGS, MO.—Business property damaged..... 50
PITTSBURGH, PA.—Torrance Ave. dwellings, Penn Township 30
BRAZIL, IND.—Plant of Brazil Wood Products Co..... 80
KANKAKEE, ILL.— Gelino dept. store & adj. property..... 250
STE. HYACINTHE, QUE.—Ledeaux garage, adj. bldgs..... 25
ST. BONIFACE, MAN.—Storehouse of Union Cattle Yds..... 25
BONANZA, OREG.—Long Pine mill, 6 mi. east..... 30
WILKES BARRE, PA.—Steel mill, Dupont Powder Co..... 25
WESTFIELD, MASS.—Templeton bldg. and adj. property..... 40
MINEOLA, N. Y.—Engr. bldg. at Mitchell Field..... 200

Convicts Burned to Death in Ohio Prison Fire

Seventeen convicts were burned to death and twenty were injured in the fire that destroyed the Ohio State Prison at Junction City, Ohio. The 225 prisoners that were thus liberated by the blaze were kept in an improvised "open air penitentiary," guarded by guards and citizens armed with shotguns. Flames were discovered at one a.m., and guards were rushed to watch the prisoners. Fire swept through the combination wood and brick structure. One convict succeeded in saving the lives of 160 prisoners when he broke down a huge bolted door to make a lane by which the men could leave through the kitchen and bakery. It is believed that the blaze started from defective wiring but Governor Donahey has ordered a complete investigation. There is very little left of the building.

Acids and Rubber Cause Three-Alarm Blaze

Three alarms were turned in to fight a fire that broke out in the three-story brick building of the Sturges Multiple Battery Company plant at Jamaica, N. Y. An explosion of a paraffine tank started the blaze, and the stock of acids and rubber added fuel to the fire. Windows in the plant, as indicated in the photograph, were blown out by the force of the explosion.

MANCHESTER, N. H.—Whse. A. A. Mooney Co.	65
ATHENS, ONT.—G. W. Beach store and adj. property	25
CLAYTON, MO.—Home of Peter Ibsen, 2 mi. west	125
SHELBURNE FALLS, MASS.—Memorial Hall damaged	45
ABBOTTSFORD, B. C.—Royal Bank bldg., adj. property	40
BIRMINGHAM, ALA.—Plant of Cruse-Crawford Mfg. Co.	40
OAKLAND, MO.—Machine shop, St. L. & H. R. R.	25
ELIZABETH, MISS.—The Pippin and Cannack stores	25
WILMINGTON, DEL.—Bldg. of Thomas Wallpaper Co.	35
DELAFIELD, WISC.—Gymnasium, St. John's Academy	100
KINDE, MICH.—Farmer's Cooperative Elevator	80
KINGSVILLE, TEX.—Shed of Missouri Pacific lines	125
GROTTO, WASH.—Business block damaged	25
SAN ANTONIO, TEX.—Bldg. of Fox Company destroyed	125
BERLIN, N. J.—Bldgs. of Penna. Pulverizing Co.	125
FLORENCE, ALA.—Residence of Percy Muse	25
UNION CITY, N. J.—Garage and contents	125
BRISTOL, PA.—Aeroplane, at Keystone Field	65
HILLSIDE, N. J.—Factory of Brown Parquet Floor Co.	35
PATERSON, N. J.—Whse. of Lamond & Robertson Co.	40
UKIAH, CALIF.—High School bldg. destroyed	60
LAMANDA PARK, CALIF.—Whse. of Ambler Grain Co.	80
SCARBORO, ME.—Barn on Portland Farms near Oak Hill	25
JEFFERSON CITY, MO.—Plant of D. M. Obirman Mfg. Co.	80
TRUMAN, ARK.—Sheds of Ozark Cooperage Co.	75

Firemen's Cycle Club Elects Officers

The Firemen's Cycle Club of New York has nominated officers for 1929. The nominations are unanimous, which is tantamount to election. Therefore, the officers for 1929 are:—President, Deputy Chief John J. T. Waldron; vice-president, Capt. Joseph L. Flannery; secretary, Dr. Herman L. Reis; treasurer, Capt. Henry Kraetzer; trustees, Capt. George Murray, Capt. William J. Lennon, Deputy Chief William Clark and Batt. Chief Frank Murphy.

The Medical Officers—Dr. Harry M. Archer and Dr. Francis M. Banta. Sergeant-at-arms is Frederick Smythe. The meetings are held monthly in the home of the "Janitor," Dr. Harry Archer, at No. 47 West 85th street, near Central Park West. The November meeting was enlivened with motion pictures and a lecture by Fire Chief John Kenlon. The pictures showed views of the Chief's recent journey through parts of Europe and to the International Congress of Fire Brigades at Turin, Italy. He was accompanied on the trip by Dr. and Mrs. Harry M. Archer and Mrs. Kenlon.

WM. JEROME DALY.

History of Fire Fighting

(*Continued from page* 1104)

was destroyed, and in an account published by one of the witnesses, he said: "the engines were play'd, but were soon burnt." This loss of engines was invariably caused by the want of hose, making it necessary to place the pump alongside the fire.

Perier in France, Leopold in Germany, and Newsham in England, contemporaneous engine makers in the early part of the 18th Century, were greatly celebrated in their respective countries. They were sometimes considered inventors of the fire engine, though very erroneously, for so far as the principle of its construction, application of the air vessel, goose-neck, hose, were concerned, the engine was perfected before their time. Their merits consisted in improving these machines in various minor details.

Alfite Gas Used to Extinguish Fires

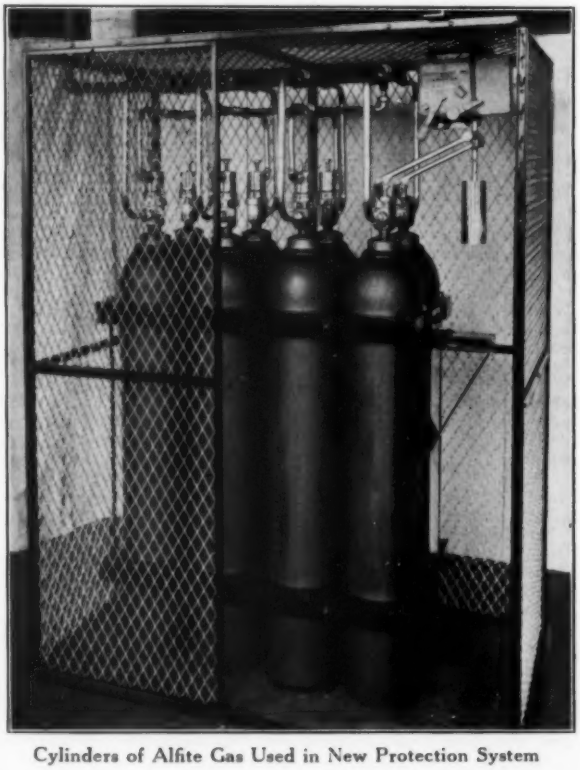
A system of carbon dioxide protection against fire known as the Alfite System is offered by the American-La France and Foamite Corporation. It employs gas confined in a liquid state in metal cylinders 51 inches in height and 8½ inches in diameter under a pressure of 900 to 1,000 pounds. When the system is placed in operation, a plunger ruptures a copper disc used to seal the gas in the cylinder, and permits the gas to pass through piping to nozzles located at the fire. Here the gas is liberated into the room or space being protected where it expands and dilutes the air so as to smother the flame.

The system may be operated manually, semi-automatically or automatically. A variety of operating devices are available, thus giving the system a flexibility enabling it to be applied to widely diversified conditions.

The gas used in the Alfite System is virtually moisture free and containing no sulphur dioxide or other gas. It is colorless and odorless and has one and one-half times the density of air.

Being a gas when freed, Alfite gas penetrates every place where air can reach. Air diluted with 17% of Alfite gas is sufficient to extinguish flames but as a factor of safety the system is designed to provide 35% dilution of the air in the space being protected. It does not damage fabrics, machinery and the like. The cylinders can be kept in cold temperatures for the liquified gas does not freeze, nor does it deteriorate.

The Alfite system is being applied to marine fire hazards. Cargo holds, machinery spaces and other inaccessible places



Cylinders of Alfite Gas Used in New Protection System

can be easily protected. By the use of a smoke detector fires in cargo holds can be located and the system placed in operation automatically.

Glendale, Cal., Votes for Fire Alarm System—By a majority of 4½ to one, Glendale, Cal., voted to issue $200,000 bonds for the installation of a fire alarm system consisting of 237 fire alarm boxes and the necessary equipment.

Many Attracted to Turin Exhibit

Visitors to the International Fire Convention at Turin, Italy, and the fire convention held at Fiume, were attracted to the display of Fyre-Freez. The background of the stand at Fiume showed Fyre-Freez coating "Hell" with carbonic snow while the Devil leaves his domain. The other exhibition space was

A Test of Fyre-Freez at the International Fair at Fiume

decorated with flowers, and had on display, the various style extinguishers made by this company.

Tests of carbonic snow in extinguishing fires started for exhibition purposes, created a desire of Italian officials and others to know more about this way of controlling fires.

New York Revives Board of Inquiry

The New York Fire Department has revived the Board of Inquiry. The Board has to do with inquisitions into accidents to apparatus. Many have occurred lately in the city. The personnel of the Board consists of Assistant Chiefs Martin and Dougherty and Deputy Chiefs Davin and Marshall. The chairman is Chief Martin, and Chief Marshall, a member of the Board, is in charge of the repair shops and apparatus.

The Board is required to delve into all phases of accidents and consequent damage to apparatus. The N. Y. F. D. Repair Shops are cluttered with broken fire engines. The annual expense for repairing damaged fire apparatus is appalling and it is with a view to minimizing accidents and attempting to impress on officers and chauffeurs with the need for greater care and diligence in traveling through crowded streets, that the Board of Inquiry is going to attempt to accomplish some good results.

WM. JEROME DALY.

Three Killed in Denver Apparatus Crash

Three firemen were killed, and two lieutenants and four firemen injured when two companies rushing to a fire at high speed in Denver, Colo., crashed at a street intersection.

Chief Healy fixes the blame of the accident on the lieutenant and driver of the apparatus that was approaching the main thoroughfare. An order was issued to all companies some time ago that companies responding to fire and approaching through streets must slow down to ten miles an hour while negotiating the crossing. It is contended that this was not done.

After the machines crashed, both trucks stopped at the curbing. One struck a parked automobile and wrecked it, after which it jammed into a tree. Firemen were hurled in every direction.

All three of the firemen who were killed are survived by widows.

It was learned that the alarm came after a ten-cent celluloid comb had fallen into a hot air register and started to burn.

Fire Prevention League Formed

Announcement is made of the formation of the Fire Prevention League of America, with headquarters at 1674 Broadway, New York City.

The league will function through state commissioners and deputies organized to promulgate a popular knowledge of fire prevention, protection and combatting methods, and overcoming fire waste. Suitable awards will be made to fire heroes in all walks of life.

Membership is to include individuals, corporations, societies, and public officials interested in fire prevention. The league will have international affiliations. The management is vested in a board of commissioners functioning through an executive committee and Lloyd E. Brown is executive commissioner. Captain Brown, formerly a General Staff officer with the Army Intelligence Service, was manager of the Home Protection Division of the National Surety Company, following ten years experience in fire prevention work.

Action of Detroit Commission Approved

The Detroit Fire Commission has recently been upheld by the Wayne County Circuit Court of Michigan on the question of the commission's right to dismiss a member of the department for intoxication and at the same time the court ruled that the Detroit Civil Service Commission has no authority to inquire into the evidence in cases where city employees are discharged for cause.

The decision reversed the Michigan Supreme Court which ordered the fireman's reinstatement over a year ago, and unless he appeals, his dismissal will again become effective. The ruling by the circuit court settles an old prolonged dispute between the municipal civil service commission and the fire department.

It was the contention of the fire commissioners that they were the proper judges of the acts of their own men and that the civil service commission is without jurisdiction over the fire commissioners in the latters determination of the sufficiency of evidence.

Box 52 Association Holds Banquet

The sixteenth annual dinner of the Box 52 Association, of Boston, Mass., was held on the evening of November 7 at the Hotel Arlington, Boston.

President P. Hildreth Parker was in charge of arrangements. Seated at the head table were Chief Daniel F. Sennott, of the Boston Fire Department; Chief John W. O'Hearn, of Watertown, Chief William H. Hill, of Belmont, Fire Commissioner Willard W. Estabrook and Chief Selden R. Allen, of Brookline, Chief William C. Mahoney of Peabody, Everett W. Shumway, state fire inspector; President Parker, Vice-President Bartlett Tyler, and Secretary Harry J. Rockett.

At the close of the dinner, a talk was given by C. Elmer Gane, photographer for Stone and Webster and Blodget, on the construction of a large power station on the Feather River in California to furnish electric power for San Francisco. Motion pictures and lantern slide views in colors were used to illustrate the lecture which was entitled "Nature's Frozen Credits."

This Introduces the Flapper Fannie Club of Pulaski, Va.

Pulaski, Va., a town of 10,000 population, is proud of its low fire loss record of $25,000 in two years. They are also proud of its Flapper Fannie Club, an organization of the local high school. The attractive members appeared with the fire department during Fire Prevention Week.

Fire Extinguishers—Their Use

(*Continued from page* 1103)

to endanger life in extinguishing ordinary fires, but it is necessary to take precautions to protect operators and others from the possible effect of its vapors, particularly when used in confined spaces, small closets, rooms or cellars, or where there is not means of quick exit.

The carbon tetrachloride extinguisher is generally of the pump type and depends for action upon a pump for establishing and maintaining air pressure or for discharging the liquid.

There have been many failures of this type of extinguisher in the field due to the sticking of the plunger from corrosion, plugging of discharge orifice and improper care.

It is important to use only the special liquid furnished by the manufacturer.

These extinguishers must be partially discharged and refilled each year. The types dependent upon a contained air pressure should be frequently inspected.

The quart and quart and a half size are rated B-2; C-2.

The one gallon and larger sizes—B-2; C-2 or B-2 and C-1.

Carbon Dioxide

This new yet old method of fire extinguishment is occupying the thoughts of fire protection engineers and scientists as never before. Nearly fifty years ago it was suggested that fires could be extinguished by liquefied carbon dioxide in pressure containers, but its use did not develop because the gas could not be readily and quickly discharged. The so-called fixed systems were developed, after uninterrupted discharge had been made possible, for protection of fires on shipboard. Cargo hold fires are different to fight, as we who live near the seaboard know from experience, and these fixed systems gave and are giving very favorable protection as the carbon dioxide is retained in the hold, permeates throughout, reduces the oxygen and smothers the fire. It is stated that today hundreds of freight, passenger vessels, oil tankers, pleasure yachts, motor boats, etc., are protected in this manner.

The desire to extend the use of this gas logically brought about the development of the portable hand extinguisher.

Today tests are being run and the fire record of both fixed systems and portable equipment being studied to determine its value and limitation as a fire extinguishing agency. So far its fire record seems favorable but many factors should be considered before definite recommendations for this type of protection can be made. No Rules nor Requirements have as yet been issued by the National Board of Fire Underwriters and the present installations are mainly the result of the engineering experience of the extinguisher manufacturer in collaboration with the Insurance and Plant Engineers. Consequently at present this form of protection is highly specialized. Rapid progress is being made in its application, so that in the near future definite information should be available.

It should not at present be considered a substitute for the older types and methods of fire extinguishment, but rather a development for certain hazards.

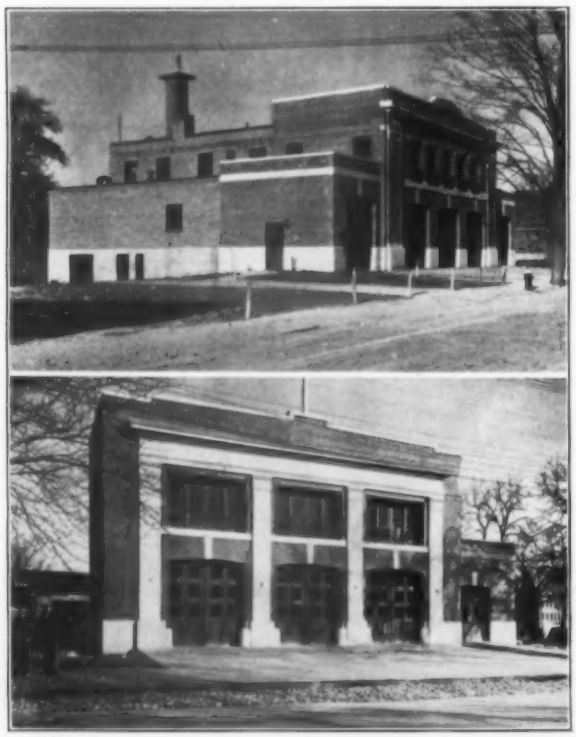
What Carbon Dioxide Is

Carbon dioxide has been known for many years to be an inert gas existing in small percentages in the atmosphere. It is a product of combustion or oxidization of materials containing carbon and therefore will not support combustion. It is produced by nature through all forms of combustion, decay, fermentation, and is given off in large quantities by certain volcanoes. In certain chemical industries it is a by-product such as in the manufacture of alcohol and other chemical processes but commercially it is mainly produced from the controlled combustion of coke. Whatever the production process the gas is collected, purified and compressed into cylinders. Pure dry carbon dioxide is colorless, odorless, tasteless, non-poisonous and non-corrosive, when dissipated leaves no residue. It is extensively used for carbonating soft drinks, soda water, etc. I am also told that it is being used in canning to stop bacteria action. The cans are evacuated and then filled with inert CO_2 to stop spoilage.

It is a non-conductor of electrical energy and has been tested up to 220,000 volts and found satisfactory as its di-electric strength is greater than air.

The weight of CO_2 is approximately fifty per cent greater than air. Specific gravity of CO_2 is 44, of air 28. Air normally contains 21% of oxygen and 79% of nitrogen.

The highest theoretical percentage of CO_2 which could be expected from combustion in air is 21% (that is all oxygen changed to CO_2 by the combustion, the nitrogen not being affected.) Therefore, if the air can be excluded by carbon dioxide practically any fire can be rapidly extinguished or spreading prevented. In fact the addition of approximately 15% of CO_2 to normal air will extinguish flame in most burning material. Some liquids and gases require a higher CO_2 percentage for extinguishment as will be noted later.



Two Handsome Massachusetts Central Fire Stations

Two new central fire stations from designs by George Ernest Robinson, architect, of Boston, are here illustrated, the upper at Stoughton, a side view, showing air whistle on roof, and the lower, at Amesbury. The new headquarters building in Stoughton is of brick, with stone trim, the central portion being two stories in height, with one story wings on each side. The floor area is 84 by 62 feet. Amesbury's new central station is of water-struck brick, with granite trimmings and is two stories high, with floor area of 68 by 63 feet.

H. BELKNAP.

CO_2 gas is stored and shipped in steel cylinders designated I.C.C. No. 3 (Interstate Commerce Commission Specification and Rating).

The pressure in the cylinders varying from 700 to 1,000 lbs. or more as the pressure varies with the temperature as an illustration at 60° F. the pressure in a cylinder is approximately 744 pounds per square inch, at 135° F. the pressure is approximately 2,670 pounds per square inch. These cylinders are designed with a good factor of safety and provided with safety discs operating at about 2,400 pounds pressure, and releasing the gas before dangerous pressures develop.

The ratio of expansion is approximately 1 to 436 under average conditions and normal temperatures. When the high pressure is released from the cylinder it almost instantaneously expands to between 400 to 500 times its original value giving under average conditions about nine cubic feet of gas per pound of cylinder content.

The statement is made that each fifty pound cylinder contains four hundred and thirty-six feet of gas at normal temperature and when discharged into nine hundred cubic feet of air will make a mixture of gas and air, thirty-one per cent, this mixture being sufficient to extinguish the flame of gasoline vapor.

Overcoming Rapid Expansion of Liquified Gas

The rapid expansion of the liquefied gas was the source of all trouble in the past. It was overcome by the use of a siphon tube which takes the liquid CO_2 from the bottom of the cylinder instead of gas from the top, the tanks being about ⅔ full of liquid and ⅓ gas, and through the use of large discharge passages, minimizes the pressure drop inside the apparatus the expansion taking place at the especially designed orifices.

This special nozzle breaks the liquid into spray which gasifies and expands instantly.

The refrigerating effect of the rapid expansion converts some of the spray directly into snow which has a temperature of 110° F. below zero.

In operation the discharge has the appearance of a white stream of snow which issues with a loud hissing noise reaching some five or six feet expanding into a cloud and dissipating like a cloud of steam.

This stream of gas and air pushes away the air and sets up a highly charged atmosphere of CO_2. The extinguishment being from both the smothering and cooling effect.

Per Cent of CO_2 Needed to Extinguish Flame

The per cent of CO_2 needed to be added to the air to extinguish flame is as follows:

Absolute Alcohol (Ethyl)	14%
Menthanol	13%
Paraffin	15%
Candle	14%
Hydrogen	58%
Carbon Monoxide	24%
Methane	10%
Coal Gas	33%

One point should be made clear—carbon dioxide is not in any way similar to the dreaded carbon monoxide of the automobile exhaust which is to be rightly feared.

Carbon Dioxide is non-poisonous. Atmospheres containing up to 5% cause no serious impairment of normal activity, it being possible to live in an atmosphere so reduced in oxygen content that a match will not burn. Higher percentages cause no permanent ill effects although suffocation can result as with any inert gas.

I will not at this time attempt to describe the operating methods of the several types of systems, some of which are operated by puncturing a thin disc, allowing the liquefied gas to discharge. Others use a specially designed quick opening valve.

The permanent piped systems are manually and automatically operated for protection of turbo-generators and electrical apparatus, dip tanks, etc. Operation is effected by the automatic dropping of weight, by the smoke from the fire itself, etc.

Sizes of Portable Extinguishers

The portable hand extinguishers are manufactured in several sizes, the principal size for hand use containing about seven and a half pounds of CO_2 and weighing about 35 lbs.

Larger units are mounted on small wheeled trucks and give a fairly large volume of CO_2.

The small hand extinguishers have been approved by the Underwriters' Laboratories and the Factory Mutual Laboratories.

Now as to their use in the extinguishment of fire—its greatest efficiency in extinguishing fires in burning liquids is where it is not necessary to maintain a fire extinguishing atmosphere for but a few seconds or a sufficient number or larger extinguishers should be present should there be a likelihood of rekindling from surrounding heated containers or material.

The cooling effect, it is true is of importance. It tends to quickly cool the surface of the burning material to somewhat protect the operator in his approach or stand before the fire. These extinguishers also need frequent checking by weighing to detect leakage.

To conclude, although the carbon dioxide extinguisher shows promise of becoming a very valuable extinguishing agent for fires under certain conditions, special study is needed before installation.

Special instruction should also be given in use of this extinguisher, whether or not it should be part of your standard equipment is not for me to say.

Supt. R. A. Brown of Bridgeport, Dead

Superintendent R. Arthur Brown, for the past three years in charge of the police and fire department-signal systems at Bridgeport, Conn., passed away suddenly on October 24. Death followed a paralytic stroke suffered by Supt. Brown while reading a newspaper in his office at Fire Alarm Headquarters. He died three hours later at St. Vincent's hospital.

The deceased was appointed as superintendent of the alarm system at Bridgeport on October 1, 1924. Prior to his appointment he was an electrical contractor. Supt. Brown was a member of the Eastern Association of Superintendents of Police and Fire Alarm Signal Systems.

He is survived by his wife and four children. The funeral was attended by a number of fire department and other officials of Bridgeport.

There was an escort of members of both the fire and police departments of the city.

The Late R. Arthur Brown

The interment was at Lakeview Cemetery, Bridgeport.

T. F. MAGNER.

Washington, D. C., Awards Fire House Contract—A contract has been awarded for the construction of a firehouse in Washington, D. C. It will cost $57,000.

NEW STANDPIPE RULES ADOPTED FOR THE CITY OF NEW YORK

Board of Standards and Appeals Formulates New Regulations—To Be Published in Their Entirety in These Columns

HEREWITH is continued from the November 14 issue the new "Standpipe-Fire Line Rules" of New York City. The original rules were adopted by the Board of Standards and Appeals of that city on June 22, 1922, were amended July 20, 1923, and again on May 18, 1928. The finally adopted form, as reproduced herewith, were adopted July 20, 1928. Through the courtesy of Chairman William E. Walsh, of the Board, FIRE ENGINEERING *is enabled to publish the entire new rules serially.*

These new rules are formulated largely through the efforts of Peter J. Maher, Fire Prevention Inspector attached to the Division of Fire Appliances of the New York Fire Department.

RULE 30. INTERMEDIATE TANKS.—The location of intermediate tanks hereafter installed shall be determined and directed by the Fire Commissioner and as prescribed in Schedule A. Each such tank shall have at least 5,000 gallons of water reserved exclusively for fire line and pump purposes. The bottom of each tank shall be at least 20 feet above the highest outlet supplied therefrom. The method of water supply to tanks, the overflow, the high and low water alarm, the emergency drain, etc., shall be as prescribed for tanks above the roof except that the overflow and emergency drain shall be connected to the drainage system of the building or discharge on intermediate levels.

The connection of the tank to the system shall be as hereinafter set forth:

Piping of the same diameter as the riser shall connect the tank with the riser of the portion of equipment supplied from that tank and in this connecting line in a horizontal run there shall be placed an approved swing check valve opening downward, and two O. S. & Y. gate valves, one at each side of the check valve. Each tank section shall be directly connected to the tank section above by means of piping of the same diameter as that of the largest riser and in a horizontal connecting line shall be provided an approved swing check valve opening upward, with an O. S. & Y. gate valve, at each side of the check valve, in order that water pumped into the siamese connection may enter the entire equipment of the building, and that each tank will supply only its portion of the system.

RULE 31. VALVES.—All valves controlling standpipe water supply except valves at hose outlets shall be iron body brass mounted, or cast steel designed in accordance with specifications of the American Society of Mechanical Engineers, gate valves shall be of Outside Stem & Yoke type, and shall be located in an accessible position. All emergency control valves 6 inch and larger shall be of the by-pass type.

RULE 32. PIPING.—Materials of Construction. All new piping for standpipe fire lines shall be of genuine full weight wrought iron or steel and properly tested by the manufacturer to withstand the required water working pressures. All pipes shall be lapwelded. Where working pressures are in excess of 150 lbs. to the square inch extra heavy cast iron, malleable iron or cast steel valves, and fittings constructed in accordance with the specifications of the American Society of Mechanical Engineers, able to withstand the required water working pressure shall be provided. The standard weight fittings and valves may be used where the pressure is not more than 150 lbs. per sq. in. Fittings in horizontal runs shall have long turns. All underground piping shall be of extra heavy iron as required by Rule 15.

The water working pressure on piping, valves and fittings shall be determined by the total head of water plus 50 pounds at the top floor hose outlet plus a factor of safety of at least 50 per cent. Specifications as to the construction and water working pressure of all pipping, valves and fittings shall be marked on plans filed with fire commissioner.

RULE 33. CONSTRUCTION. Each standpipe fire line riser shall be supported at the bottom and at every other (alternate) story, and shall be properly braced. Horizontal lines shall be supported by standard heavy wrought or malleable iron hangers attached to or extending around and over floor beams at intervals of not more than 8 ft., and at more frequent intervals if deemed necessary by the Fire Commissioner and shall be securely braced to withstand vibration. Hanger may be supported by straps or bars extending over and around bars of at least 1 in. in diameter and 12 in. in length embedded in concrete floors parallel to and at least 2 in. from the undersurface or by approved malleable iron concrete inserts. The arrangement of lines must be straight and as direct as practicable. Offsets will be permitted only when unavoidable or where necessary to install horizontal check values. Except where flange fittings and pipes are permitted elsewhere in this rule, all joints shall be screwed joints made up thoroughly water tight with red lead, litharge and glycerine, or compressed graphite lead and boiled linseed oil, or any joint compound that shall be approved by the Board of Standards and Appeals.

In horizontal runs of piping of standpipe fire line systems, if larger than 4 in. in diameter, fittings and valves may be of the flange type, provided flange faces are machined true and smooth and do not show rings, sand holes or other inperfections. All joints shall be provided with proper copper gaskets.

All standpipe (fire line) equipments shall be installed in a workmanlike manner.

RULE 34. PROTECTION OF FIRE LINES.—Standpipe lines when not located within a fire protected stair enclosure shall be protected against interior fire damage by means of at least one inch asbestos covering, or a covering of expanded metal lath and three-quarters inch Portland cement plaster or by a 2 in. terra cotta block encasement.

RULE 35. FROST PROTECTION.—Standpipe lines shall be properly protected from freezing in the following manner:

One wrapping of tar paper equivalent to Asphalt Saturated Wood Felt paper weighing 12 lbs. per 100 sq. ft.

Three (3) layers of standard 1 in. high grade "long cows' hair" felt interposed and covered with one (1) layer of builders' paper equivalent to red rosin sized sheathing paper weighing 40 lbs. per 500 sq. ft.

One (1) covering of 8 oz. canvas, painted with two (2) coats of waterproof paint.

All wrappings to be independently applied and securely fastened in place with heavy jute twine. Circumferential and longitudinal joints to have at least a 2 in. lap staggered with adjacent layers and opposing leakage to the hair felt.

In groups of pipes each water pipe is to be wrapped separately with the tar paper, but subsequent layers of felt and paper may be applied collectively if space does not permit of individual wrapping.

Where a heating pipe is one of the group, the wrapping should be applied so that the hot line would serve all pipes in the enclosure. The initial wrapping of tar paper around each water pipe should be applied with laps down and the whole group wrapped with tar paper with laps up. If due to the position of the hot line sufficient air space would not insulate the hair felt, then protection to be affected by suitable separators, or a wrapping of asbestos paper instead of the tar paper around the group.

On vertical pipes particular provision to be made to prevent slipping and tearing of insulation due to its weight.

To prevent slipping away of insulation at point of entrance of pipes into a tank, and to shed leakage from slip joints, a 16 oz. duck to be provided, doubled and securely fastened to bottom of the tank overlapping inside and outside the insulation of the group for a distance of 18 in. below the tank. This duck to be well coated with paint. Loose hair felt to be packed about connection at tank bottom to safeguard against settling.

RULE 36. NUMBER OF RISERS.—Each building fronting on more than one street shall have at least one riser for each street front. For the application of this rule a corner building shall not be considered as facing on more than one street when it is but one corner. In all cases regardless of area or location there shall be a sufficient number of risers, so that any portion of each floor area may be covered by the stream from a standpipe hose not exceeding 100 ft. in length.

RULE 37. FIRE TOWER RISER.—Each standpipe riser shall be located within a stair enclosure and one riser must be located in main stairway or fire tower.

Where impracticable to locate a riser within the stair enclosure, the Fire Commissioner may permit it to be located immediately adjacent to a stair enclosure, public corridor or other suitable place.

RULE 38. HOSE STREAM ALLOWANCE.—Not more than 10 feet will be allowed for the throw of hose stream, except where the static pressure at the hose outlet is 15 lbs. or more, when 20 ft. will be allowed.

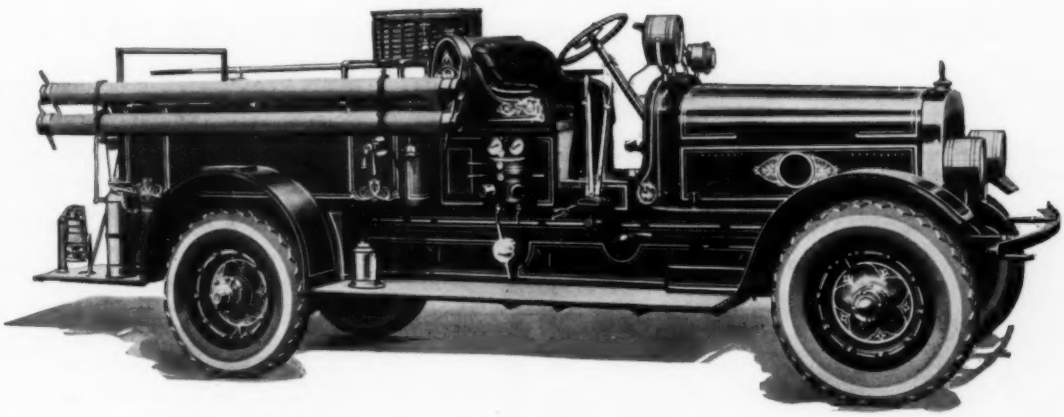
RULE 39. SIZE OF CROSS-CONNECTION.—Where there are two or more risers in a standpipe (fire line) equipment, all risers shall be cross-connected by piping of a diameter at least equal to the diameter of the largest riser, but in no case shall the cross-connction be less than five inches.

RULE 40. FIRE PUMPS.—Where required:

(a) In every building hereafter erected exceeding 250 ft. in height, as described in Schedule A, an electric centrifugal fire pump shall be kept in readiness for immediate use of the Fire Department during all hours of the night and day, including Sundays and holidays.

(To be continued)

The Seagrave Standard Pumper
—fire's worst enemy



Standard Equipment In Over 700 Cities

THE pumper which meets every requirement of both large and small fire fighting organizations is the Seagrave Standard Pumper. When the Seagrave Standard Pumper and fire meet, the fire must die in defeat. It is, indeed, fire's worst enemy. Efficient, reliable, it meets every need.

The centrifugal pump and engine driving it are high speed units, perfectly synchronized. No pulsation in the hose line with the Seagrave Standard Pumper. No vibration of the engine.

The construction of the Seagrave Standard Pumper is so simple that it is seldom out of service and the maintenance cost is very low. For these reasons it has been selected by fire departments in more than 700 cities throughout the world.

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A complete ball-bearing motor. Electric Siren that will not run down your battery. Our SIRO-DRIFT uses about two seconds of current out of every sixty. Clutch between Siren and motor that will start an automobile. One trial of a SIRO-DRIFT means one hundred per cent equipment.

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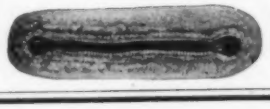

If you purchase BI-LATERAL FIRE HOSE it will increase the value of your hose-carrying apparatus more than the cost of the load of Bi-Lateral Fire Hose.

We can load from 25% to 33% more and when coupled with rocker lug couplings the Bi-Lateral hose makes an apparatus one to be proud of and as near perfect as possible to do quick and efficient service.

FIRE DEPARTMENT ACTIVITIES

Tiffin, O., to Vote on Bond Issue—Tiffin, Ohio, is to vote on a $12,000 bond issue for the purchase of fire apparatus.

Newburg, Ia., Is to Have Department—A volunteer fire department is being organized in Newburg, Ia.

Fire House Opened in Yonkers, N. Y.—A new fire house has been opened in Yonkers, N. Y.

Washington, D. C., to Have New House—A new fire station will be erected in Washington, D. C., on Sixteenth and Colorado avenues northwest despite an attempt to prevent such action. The station will cost nearly $60,000.

Babylon to Erect Houses on Beach Land—The town of Babylon, N. Y., will erect three fire houses on beach lands owned by the town. The town is now advertising for bids for such construction.

Proposed Fire Alarm for Columbus Delayed—The plan to erect an east wing to the city hall project in Columbus, Ohio for $20,000 to house the fire alarm system, has been postponed indefinitely.

Lawrence Man Fined for False Alarms—A man in Lawrence, Mass., was given a three months' sentence for riding around in a taxicab, intoxicated, and turning in three false alarms.

Trenton, N. J., to Have More Flood Lights—Additional flood lighting equipment is being constructed for Trenton, N. J. The first unit has been so satisfactory that an additional one will be placed in service.

Iowa Firemen Must Buy Own Uniforms—According to J. W. Long, state auditor, Iowa, all paid firemen in the state must buy their own uniforms. The law makes provision for the purchase of equipment but does not include uniforms.

Farmers Buy Fire Apparatus—Four Clay county townships in the vicinity of Brazil, Ind., have made an agreement with the city council whereby fire apparatus would be purchased for the protection of the rural districts.

Fire House Opened in Yonkers, N. Y.—The new fire headquarters of Yonkers, N. Y., was formally dedicated on November 10. On that day the building was opened for public inspection.

Chief Watson Against Limiting Apparatus Speed—Chief George S. Watson of Washington, D. C., is against a suggested plan to limit the speed of fire apparatus. He said such a move would increase the property hazard.

Astoria, N. Y., Fire House in Service—The new fire house at Astoria, N. Y., has been officially placed in service. It is a duplicate of the fire headquarters recently opened in Flushing.

Man Ousted in 1923 Appeals Case—A fire captain ousted a few weeks ago by Safety Director Barry of Cleveland, Ohio, after being under suspension since 1923, has appealed to the civil service commission for reinstatement.

New York to Extend Fire Alarm System—It is probable that the fire alarm system of Queens borough will be extended to the communities between Long Island City and Jamaica, N. Y. The cable will be placed underground. The estimated cost for the extension is $66,000.

Firemen Injured at Dump Fire in Suffern—Assistant Chief Ernst and another officer of Suffern, N. Y., were injured while fighting a dump fire. The refuse collector is held to blame for permitting material to be burned in other than the village incinerator.

Idaho Falls, Ida., Wants Fire Station—The architect who is drawing plans for a municipal building in Idaho Falls, Ida., has been instructed to prepare plans for a fire station unit for that building to cost $35,000. The fire station will be fifty-three by eighty-four feet.

Philadelphia Firemen Want Pay Increase—A campaign is under way in Philadelphia, Pa., to increase firemen's wages. According to a survey, twenty-eight cities pay their firemen more than does Philadelphia. A hoseman receives $2,007.50 and the pay in other places ranges from $2,200 to $2,520.

Poughkeepsie, N. Y., Wants Central Station—The mayor of Poughkeepsie, N. Y., has suggested that the city sell the property of several fire stations and to erect a central fire station. It was argued that the cost of maintaining one large building would be less than to maintain several separate buildings.

Fire House Opened in Flushing, N. Y.—Commissioner Dorman and the New York Fire Department participated in the dedication of the new fire station opened in Flushing, N. Y. The building was erected at a cost of $70,000, and $170,000 has been set aside for its maintenance for the first year. Many local civic organizations participated in the ceremonies.

Newton, Kans., Selected for Convention—At the convention of the Kansas Firemen's Association held in Liberal, Newton was selected as the 1929 convention city. The officers are B. E. Deckert, Manhattan, president; Harry Leonard, Kansas City, first vice-president; K. D. Doyle, Wamego, secretary and George T. Mohrbacher, Marysville, treasurer.

Work on Fire Station Held Up—Work on the erection of of a fire station in Oklahoma City, Okla., has been held up due to firemen working on the project. It has been stated that firemen can not legally do the work unless bids were invited first. Then if it is believed that the firemen can do the work cheaper than the lowest bidder, the other bids can be discarded. Labor unions protested against employing firemen for such work.

Company Officers Must Hold Daily Drills

One of the most drastic orders that ever emanated from Fire Headquarters in New York came to light on November 15th. It reads:

"Commanding Officers are hereby directed to drill their companies for at least one hour each day in the handling of all tools, apparatus, appliances and in the evolutions required in existing rules and regulations and special orders. The time of the beginning and cessation of drills shall be entered in the company journal, together with a record of any interruptions occurring due to response to alarms for fire.

"Chiefs of Battalion shall personally supervise the drill in at least one company each week.

"Deputy Chiefs of Department shall keep an accurate record of the activities of companies and of Chiefs of Battalion under this order, and shall at all times be in a position to make a report to the Chief of Department (when called upon) concerning the efficiency of each unit. Where lack of interest or indifference is shown on the part of officers or firemen in carrying out drills, they shall forward a special report.

"The foregoing shall be considered supplementary to all rules governing drills."

The foregoing order has what the firemen call "teeth" and it seems to be the indirect result of recent surveys which Chief Kenlon has been making on his own account. It has been known for some time in New York that Chief Kenlon has not been any too well satisfied with the knowledge of company officers with their own equipment.

A recent quiz conducted at headquarters among the captains of twenty scattered fire companies with relation to building reports showed in many instances a startling ignorance. In a big organization of 6,500 members with over 300 fire companies to be responsible for, a little laxity is not believed surprising. In the aforementioned order, every battalion and division chief is held responsible.

The order was not accompanied by any remarks or comments. It has been learned unofficially that Chief Kenlon's recent experiences at a big fire in Brooklyn impelled him to "Jack the boys up."

One of the trials of commanding a fire department as big as New York is the fact that there are five separate political or topographical divisions or boroughs, separated by rivers and connected by bridges or ferries. Some of the most important subdivisions of such a large department are sometimes many miles away from headquarters which is located in downtown Manhattan. It may seem strange, but it is nevertheless true, that it is human nature for some firemen to change their ways, their ideas, their mannerisms, their aspect on their job, once they get away from the environment and the atmosphere of Manhattan Island.

When New York was consolidated in 1898 and absorbed the old City of Brooklyn, it was for years an uphill struggle to adopt the Brooklynites to the New York Fire Department formula. Chief Croker and Chief Kenlon, his successor, waged a long campaign in that direction. One of the first resorts was to send seasoned officers to take command in Brooklyn, the Bronx and Queens as well as Staten Island.

WM. JEROME DALY.

PROPOSED IMPROVEMENTS

Pontiac, Oakland Co., Mich.—City Commission has authorized the selling of bonds which include $18,000 for the purchase of additional fire equipment and apparatus and $96,000 for fire stations, according to reports.

Williamstown, Gloucester Co., N. J.—Funds are being raised for erection of new fire station by Williamstown Fire Co., on Library Street.

Manchester, Hillsborough Co., N. Hamp.—Board of Fire Commissioners requested Board of Mayor and Aldermen for an appropriation of $14,000 for purchase of a new 1,000 gal. pumper for Hose Co. No. 3, in South Manchester. Charles H. French, Chief of Fire Dept.

Wichita Sedgwick Co., Kans.—A contract will be let shortly for construction of a fire station at Third Street and Wabash Ave. Estimated cost $28,500.

Auburn, Cayuga Co., N. Y.—City Council has approved the proposition of issuing $47,000 in bonds part of which is to be used for the purchase of a new pumper and aerial ladder truck for fire department.

Ashtabula, Ashtabula Co., Ohio—Ashtabula Township voted in favor of a $20,000 bond issue for erection of fire station and purchase of fire apparatus.

Wenatchee, Chelan Co., Wash.—At recent election city voted in favor of the $89,000 bond issue to purchase new fire apparatus and erection of new fire station.

Position Wanted

Sanitary Engineer, Junior, A. S. C. E. Age 26; single; college graduate; 1½ years in charge of purification. Desires connection with water supply or sewerage disposal plant. Address Box 161, % WATER WORKS ENGINEERING, 225 W. 34th St., New York City.

10-24

For Sale
Parade Carriage

50 years old. Has three silver bells with polished steel and nickel. No reasonable offer will be refused. Milford Fire Department, Arctic Engine Co. No. 1, Milford, Conn.

11-14

Baltimore Has Foam Company

Chief August Emrich of Baltimore, Md., always seeking to keep abreast with modern fire-fighting methods, has placed in service a squad wagon fitted with appliances for fighting fires with foam. It has a nozzle mounted on the end of a long pipe, for fighting fires in upper floors. The nozzle is controlled from the back of the driver's seat. The apparatus carries four Fomon foam generator outfits, three-tons of Fomon powder and accessories.

Foam Co. No. 1 of Baltimore Fire Department

Number of Persons Protected by Each Fireman

In order to act intelligently on a request for a larger fire department personnel, the Indianapolis Chamber of Commerce conducted a survey to determine how that city compared with other municipalities as to the number of men in the department and the amount of population protected by each fireman. The Chamber of Commerce made the following tabulation of the information:

Name of City	Rank in Population	Total Population	No. of Members in Dept.	Population per Member of Dept.
Minneapolis	16	477,700	886	505
San Francisco	11	576,000	1,091	528
Washington, D. C.	13	540,000	963	561
Newark	15	466,700	805	580
Boston	9	793,100	1,361	583
Seattle	20	375,300	626	599
Jersey City	23	321,500	532	604
Baltimore	8	819,000	1,343	610
Indianapolis	21	374,300	606	617
Buffalo	12	550,000	872	631
St. Paul	31	250,100	387	646
Rochester	22	324,500	483	672
Cincinnati	18	412,200	579	712
Detroit	5	1,334,500	1,875	712
Toledo	25	305,400	417	732
Columbus, Ohio	26	291,400	355	821
*Pittsburgh	10	665,500	809	822
New Orleans	17	424,400	498	852
Kansas City	19	383,100	430	891
New York	1	5,970,800	6,684	893
St. Louis	7	839,200	903	929
Dayton, Ohio	42	180,700	192	941
Cleveland	6	972,500	1,031	943
Philadelphia	3	2,035,900	1,959	1,039
Los Angeles	4	1,383,052	1,331	1,039
Chicago	2	3,102,800	2,486	1,244
**Akron, Ohio	33	225,000	151	1,490
Milwaukee	14	536,400	256	2,096

* 1920 U. S. census estimate.
** 1926 estimate. All others 1927 estimates.

Vandals Wreck Fire Apparatus

The trustees of Pelham Manor, N. Y., a suburb of New York City, where John J. Brennan, a former New York City battalion chief, is now the paid chief of department, have offered $1,000 reward for the arrest and conviction of the person or persons responsible for damaging the fire apparatus of that village.

Recently, the American-LaFrance pumper there was found to have a chiseled collar on the water pump. The extent of the damage could not by any stretch of the imagination have been due to other than maliciousness. Since Chief Brennan took command last spring, feeling on the part of the "die-hard" element among the volunteers has been bitter. Pelham Manor is a community of the more expensive homes owned by prosperous New York business men, financiers, lawyers and leaders in industry and commerce. These hard-headed merchants realized the need for a trained, experienced and paid fire chief, if their property and its invaluable contents were to be adequately protected from fire.

Chief Brennan did not seek the post, rather the Trustees of the Village sought him or somebody his equal.

WM. JEROME DALY.

Prophetstown, Ill., Buys Fire Apparatus.—Prophetstown, Ill., has purchased a 500-gallon pumper with an eighty-gallon booster tank for $6,750.

Ask to Abolish Lieutenant Office in Seattle—Action has been started to abolish the rank of lieutenant in Seattle, Wash., and to increase the number of fire captains. The matter is now before the city council for action. Chief Mantor believes that it would add to the efficiency of the department to adopt the change.

CONVENTION DATES

Dec. 10.—NORTHWEST ARKANSAS FIREMEN'S ASSOCIATION. Semi-Annual Convention, Fayetteville, Ark. Secretary-Treasurer, F. M. Brock, Bentonville, Ark.

April 11-13, 1929—ARIZONA STATE FIREMEN'S ASSOCIATION. 6th Annual Convention, Yuma, Ariz. Secretary, Chief W. J. Nemeck, Douglas, Ariz.

Aug. 7-9, 1929—SOUTHWESTERN ASSOCIATION OF VOLUNTEER FIREMEN OF NEW YORK. Annual convention, Falconer, N. Y. Secretary, Royce Alden, Falconer, N. Y.

The New Eastman Deluge Gun

The New Eastman Deluge Gun is a Portable Turret Pipe that can be used on the truck or ground, as may be desired. The stream can be operated in any direction by one man.

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Headlights — Searchlights
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We can supply parts for Gray & Davis lamps also.
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Have you considered the non-tarnishing chromium plate finish?

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(Reg. U. S. Pat. Off.)
FIRE HYDRANTS
for
DOMESTIC
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HIGH PRESSURE
Service

NOTE—

The positive waste value.

All operating threads are dry, being above the stuffing-box.

No toggles, no small, quick-wearing parts.

All moving parts are bronze or bronze-bushed.

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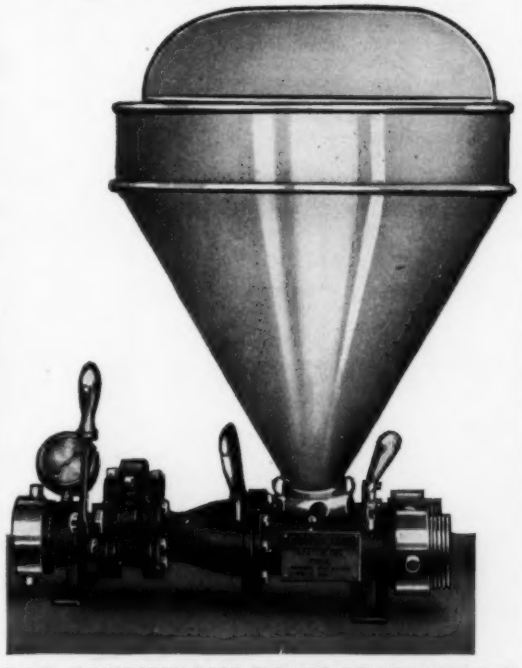

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FALSE ALARMS

Courtesy, Ladies Home Journal

"Sorry to bother you, but can you give me a light?"

THE SOLUTION

An alien who had become a nephew of Uncle Sam just long enough to make him eligible for office was elected to the council of an up-state coal town.

For some time the fire company had been having trouble with the fireplugs and although the council members had pondered and debated much the problem was still unsettled.

The night arrived when the newly elected member made his councilmanic debut. The council immediately began a discussion of better hydrants. The new member, doubtless thinking here was an excellent opportunity to make a good impression, rose and after being recognized by the council president, said in broken English:

"Gentlemen, I suggest that the fireplugs be inspected before each fire."

SUCH IS AMBITION

Nothing could stop him in his ambition to be a fireman. Not even the civil service commission who incorporated in their rules that an applicant for the fire department must have so many teeth on each side of his mouth—bridgework accepted. And so the ambitious one made a number of visits to his dentist and at the last visit, received his bill. He looked at it for some time:

"What's this extra five dollars for?"

"That," replied the dentist, "is for squeezing the arms of my chair out of shape."

Then there is the girl who bought her fireman friend a smoking jacket.

MODUS OPERANDI

A most interesting case was being heard in court. A witness was on the stand as the star witness for the state in an arson case.

The counsel for the defense asked the witness: "You say that the fence is eight feet high that surrounds the house, and that you were standing on the ground—not mounted on a ladder or anything?"

"I do," replied the witness.

The counsel gazed at the witness triumphantly.

"Then perhaps you will kindly explain how a man not quite five feet tall could see over a fence eight feet high and swear he saw the prisoner set fire to the house."

The witness calmly replied: "There's a hole in the fence."

UNION-HOUR SERVICE

Queer things can happen on Hallowe'en. For example in one village, the following sign was noticed hung from the door of the fire house:

This Place Will Be Closed on Saturday Afternoon.

"The chief has a new siren for his car."

"Why, what happened to the blond?"

THE END OF ALL

The meeting of the Ladies' Aid Society switched to a very heated discussion on family ancestry and who's who. One member not to be sidetracked by the glory claimed by other families, said:

"I'm telling you, my grandfather was a very distinguished man."

To this, one noted for her sarcastic remarks, replied: "Who distinguished him?"

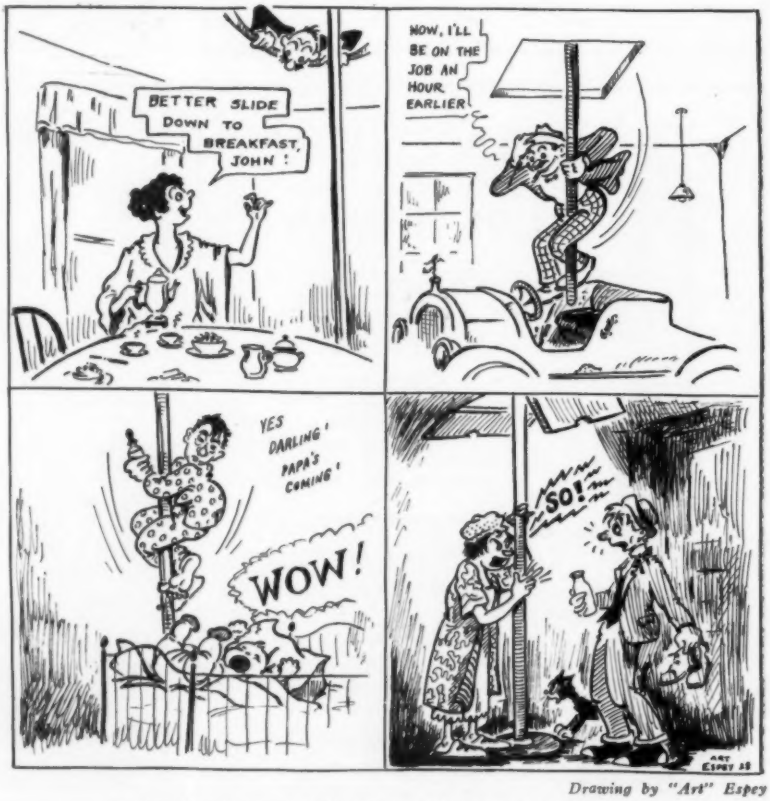
Alcohol is very perishable—here today and gin tomorrow.

EVERYTHING NOTED

Maybe it is not proper to tell this story, but since no names are mentioned no harm will be done.

Some one in Chicago prepared to check out of a hotel. He collected the bed linen, the light globe, towels and sc forth. As he opened the door on going out, he noticed the sign, "Think! Have you forgotten anything?"

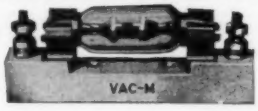
So the man turned around and took the Gideon Bible.



Drawing by "Art" Espey

What May Happen if the Brass Pole Is Used in the Home

The brass sliding pole so common in many fire stations is now being used by a newspaper to make it easier for pressmen to go from floor to floor. It is possible, that some architect will now realize the value of such an appliance in the home. In the morning when seconds count, it will speed the ever-tardy husband on his way. In the evening — oh well, there has to be a damper to everything.



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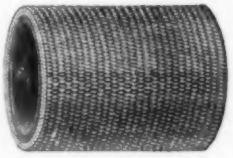

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225 W. 34th St., N. Y. C.

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51 Gasoline & Oil Handling Equipment.
52 Goggles, Firemen's.
53 Helmets, Metal, etc.
54 Hose Carts, Reels & Racks.

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This page is here to make it *convenient* for you to get complete specifications and prices from *reliable* manufacturers of equipment needed for your department. It is *your* page to use freely without any obligation.

To get the information you want, just mail in the coupon below with your name and address and numbers that indicate the equipment listed below on which you would like descriptive literature.

We will then notify reliable manufacturers of your interest in such equipment and request that they send you complete information. They will gladly do this and it will be a pleasure for us to help you in this way. No charge whatever!

For Information on Any Equipment Not Listed, Write on This Page or Use Separate Sheet.

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58 Hose Holders.
59 Hose Jackets.
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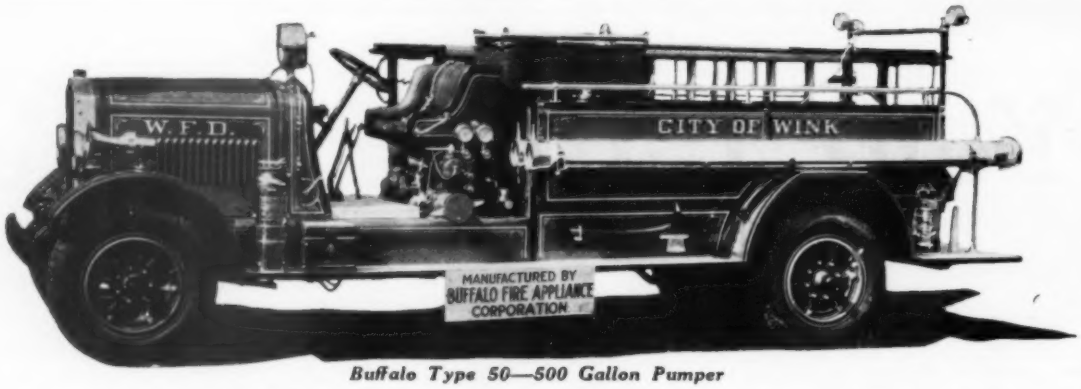

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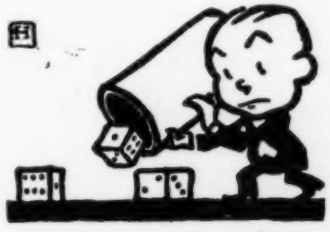

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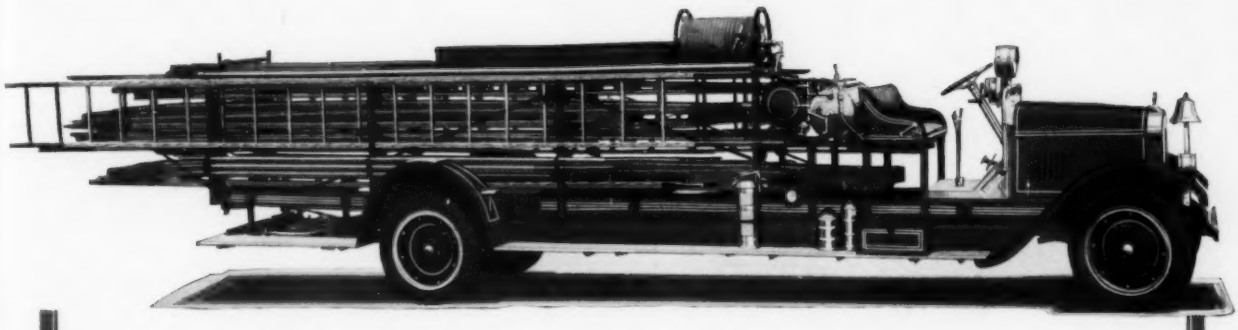

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